ELECTRICAL

QUIZ

Consistent advertising of the convenience and economy of the modern electric roaster has helped to raise its status almost to the level of a major appliance. A healthy demand has been created which encourages the manufacturer to produce better merchandise and the dealer to sell it more aggressively.

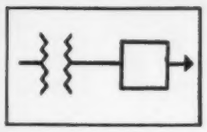
At the same time thousands of homes are being equipped with an electrical convenience that still further emphasizes the need for adequate wiring—more outlets, more circuits,—heavier wire and conduit.

The dealer, the contractor and the utility all have an equal stake in promoting the increased use of electricity. Edison advertising played an important part in raising home consumption to an average of 946 kilowatt hours in its territory last year.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

3-39

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), March, 1939, Vol. 82, No. 3. Published monthly by the McGraw-Hill Company of California, 883 Mission St., San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shillings). Single copy 25c.
Copyright, 1939. McGraw-Hill Company of California.



A single-circuit unit substation without disconnect switches, installed by Coast Counties Gas & Electric Co.

12% Saved in Installed Cost *by Using* a 1000-kva G-E Unit Substation

Coast Counties Gas & Electric Company Installs It Overnight

EVERY claim that General Electric has made since it pioneered the unit-substation idea, in 1931, was met by this interesting installation:

1. Costs less to install: Coast Counties figures a 12 per cent saving in actual cost, installed. Installation labor amounted to only 2 per cent of the cost of the equipment.

2. Saves time in installation: Installed overnight, without interrupting heavy work schedules of construction crews.

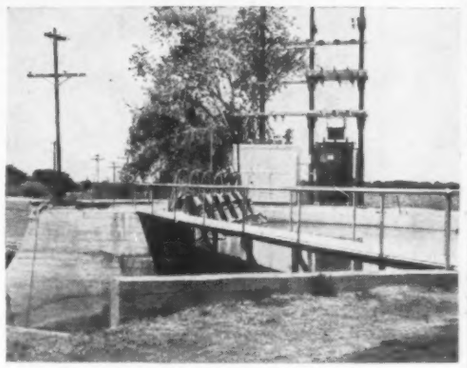
3. Saves on real estate: Over-all dimensions of the unit are 10 feet, 2 inches; by 7 feet, 6 inches; by 13 feet high.

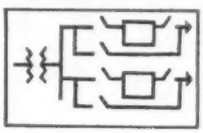
4. Attractive appearance: The company used photographs of the proposed equipment to convince land owners that the installation would not be an eyesore.

5. Saves on system investment: Load growth can be taken care of in small increments by low-cost unit substations which can later be moved complete to other locations.

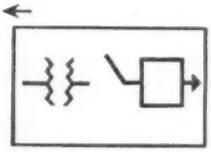
The Coast Counties installation is a single-circuit unit without disconnect switches. Other installations pictured here show a single-circuit unit with disconnect switches, and a multiple-circuit unit with disconnect and by-pass switches.

For that next area to be served, try a G-E unit substation and experience the satisfaction that dozens of users are enjoying. General Electric Company, Schenectady, N. Y.





↑ Multiple-circuit unit substation installed on an Arizona irrigation project



← Single-circuit unit substation with disconnect switches installed by a Southwestern utility

Visit the Golden Gate International Exposition painted with light by General Electric

GENERAL ELECTRIC

310-37

BETWEEN THIS MONTH'S COVERS

Exposition

WORLD'S FAIR (p. 17): If all the stories which have been written about the Golden Gate International Exposition were combined, they would probably fill an unabridged dictionary. Here, however, in 16 pages of pictures and text are facts—vital to all electrical men—which will never appear elsewhere. The Western World's Fair is important for four reasons: (1) It will stimulate a nation-wide awakening to the West, its resources, its possibilities, its existing facilities and markets. (2) It will create a realization of what the Pacific Ocean and South American countries can and do contribute to the future of the West and the U. S. (3) It is a lighting exhibit of an infinite variety of methods, techniques and effects. (4) It is a source of ideas and suggestions for display and advertising, for lighting and electrical usage which should stimulate business everywhere. ELECTRICAL WEST'S insert is your guide to the Fair and what it means to you. Separate copies are available at 25c.

Facsimile Radio

PICTURES ON THE AIR (p. 33): Facsimile radio is a system for sending, at regular broadcasting frequencies, signals which cause a printer mechanism to reproduce a picture. The picture may be printed matter. Experiments with the equipment have been under way for a few years, but last month the McClatchy papers started broadcasting to 100 receivers located in Fresno and Sacramento, Calif., homes. This inaugurated the first daily schedule of broadcasting to private residences and the first network broadcasting—KFBK and KMJ being networked. Each night, McClatchy broadcasts an 8-page newspaper. A page measures 8½ x 11 in. and takes 20 min. to print. At breakfast time, the subscriber tears off the long strip of paper that has exuded from the table-top-size facsimile receiver.

Distribution Economy

CAPACITORS TRANSFERRED AS PEAK LOADS SHIFT (p. 35). The use of capacitors to improve power factor on distribution systems is a practice which has become common only in the last few years. Principal reason is not until a few years ago were capacitors available at low cost. New schemes for using the units effectively on distribution systems are constantly appearing. Henry H. Buell, who is electrical superintendent of P. G. & E.'s San Jose Division, describes a pole-top installation which can be transferred to either of two circuits. Since peak loads on the two circuits occur in different seasons, the scheme keeps the units from lying idle for half a year. Possible objection says Mr. Buell, is the necessity for sending men out to throw the switches.

Tips on Writing

HIYA, SHAKESPEARE (p. 37): To any man who really knows his subject, writing about it should be easy. Don't make it hard. Put down your ideas in the most straightforward, simplest way you can. Writing will help to crystalize your thinking.

Farming

RURAL LOADBUILDING (p. 39): George Asher, of Green Island, Ore., recently installed soil-heating cable in one of his muskmelon propagating beds. Comparing results with an unheated bed, he found that in the former melon-seed propagation was 95%; in the latter, less than 50% . . . What effect does a cooled poultry house have on hen mortality and egg production? It's impossible to say for sure. But a survey last year showed that mortality is lower in a cooled than in an uncooled house.

Bid Depositories

WHAT? ANOTHER OGPU? (p. 40): Several states have passed laws saying it is legal for contractors' associations to set up bid depositories. The U. S. Constitution says it is illegal to pry into a person's private business without a warrant. Nevertheless, contractors assert, the PWA is sending out investigators whose business it is to pry into the operations of bid depositories and prove that the contractors are guilty of some crime.

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Cover: An Electrical West photograph of the Golden Gate Exposition's Court of the Flowers

Improvement

ASSOCIATIONS (p. 43): If fiesta spirit and cowboy hats mean anything, business is going to be better. That, at least, is the conclusion which may be drawn from the exterior appearance of the wholesalers who met in Del Monte last month. The talk and speeches were just about as encouraging. N. J. McDonald, of Thomas & Betts, said, for example, that most companies are budgeting more than in 1938.

Selling

SALES PARADE (p. 44): Harry Black & Son operate an appliance store on the outskirts of Portland. Faced with competition from downtown dealers, they have developed an idea which makes friends for them and sells appliances. This is a "club center," equipped with an all-electric kitchen, in which club women hold meetings free of charge . . . In order to assure their salesmen a steady salary, Montana Power and Washington Water Power have worked out a compensation scheme which has met the approval of the salesmen. By simple arithmetic, any man can tell now exactly how much money he will get the second half of this year . . . In selling refrigerators, dealers often underestimate the selling power of various features. A Westinghouse survey shows, for instance, that 27% of 1,000 purchasers bought the refrigerator because of its low-operating cost; after use, 31% rated low-operating cost as the best feature.

Coming Up

NEXT MONTH: Buyers of electrical products often complain that they know what they want to buy and the name of the company they want to buy from, but be damned if they can remember *where* they can buy. Who, they ask, handles PQR's line in Denver or Butte or Los Angeles? Where is EFG's Seattle or Phoenix or Salt Lake branch located? These are the very questions that ELECTRICAL WEST will answer in April. Published at that time will be our annual Manufacturers' Directory, listing all electrical manufacturers, their Western branch offices and representatives.

IT'S PART OF THE INSULATOR

R-I-P Process not an Added Gadget..

The attempt to eliminate radio interference due to capacity arcs at the insulator is not new. For years engineers have struggled with this exasperating problem. Yet it remained for Westinghouse to create and develop a special metallic oxide glaze to eliminate this kind of radio interference — permanently and completely.

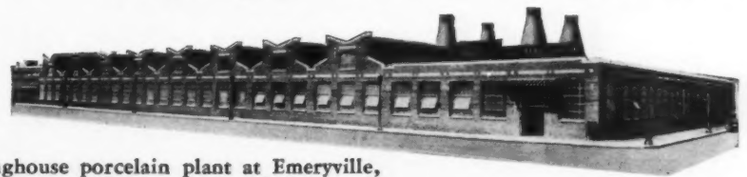
Westinghouse R-I-P (radio interference - proof) Porcelain is not new. It was first proved in hundreds of grueling tests — both in the Westinghouse Laboratories and in the testing divisions of major power companies . . . and later in thousands of actual installations from coast to coast.

Westinghouse R-I-P Porcelain does not require added gadgets, metal attachments or basic changes in insulator design to eliminate radio interference. A specially developed metallic oxide glaze covers the tie-wire and conductor area. In the normal firing and maturing operations, this metallic oxide glaze becomes a part of the insulator itself . . . and provides a correctly-located area of high resistance, conducting ceramic glaze which prevents arcing flow of charging current and distressing corona.

Lasts as Long as the Insulator

There is nothing to deteriorate on a Westinghouse R-I-P Insulator. No added cantilever, thermal or torsional strain is thrown on the insulator. There is no metal to wear, corrode or loosen and thus aggravate radio reception. Frequent and costly inspection is eliminated. Interference-proofing is a part of the insulator itself. You may expect extra long life from Westinghouse R-I-P Insulators with no reduction in their ability to eliminate radio interference. A nation-wide network of supply depots provide overnight service. Porcelain plants in Emeryville, Calif., and Derry, Pa. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania. J-05043

There is no added cost for Westinghouse R-I-P Insulators



This Westinghouse porcelain plant at Emeryville, Calif., is the only porcelain plant on the West Coast. It makes all sizes of electrical porcelain for this area.

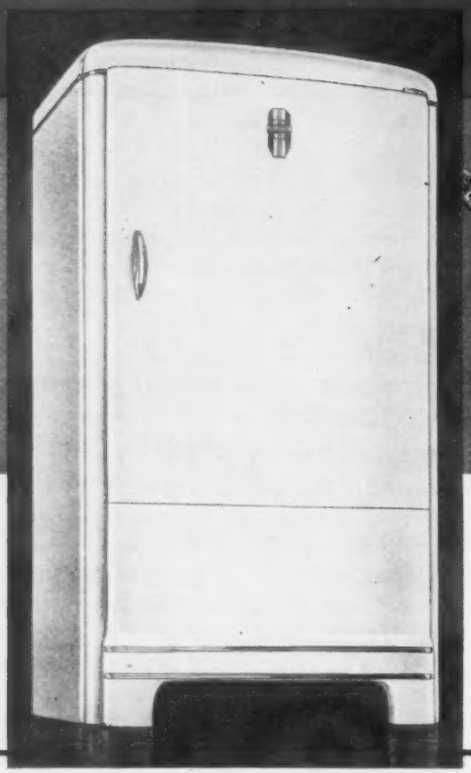
Westinghouse Porcelain

W
WESTINGHOUSE ELECTRIC

Frigidaire and General Motors Present The World's First "Cold-Wall" Refrigerator

1939 FRIGIDAIRE WITH THE METER-MISER

BUILT ON AN ENTIRELY NEW PRINCIPLE!



Reproduced from certified, unretouched photographs of identical foods, refrigerated, uncovered, at comparable temperatures.

Sensational New-Type Refrigerator opens up new era in better food-keeping . . . saves food's vital juices from drying out . . . preserves food vitality for days longer . . . now being shown to the public!

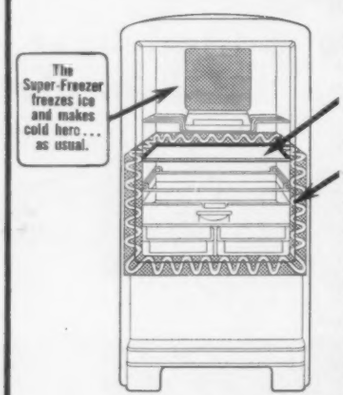
● Years in the making . . . now years ahead! . . . Frigidaire and General Motors have scored another triumph of engineering . . . in presenting for the first time this amazing new "Cold-Wall" Frigidaire.

It's now being shown to the public. Truly, it's a modern food-keeping miracle. For now it is possible to store even highly perishable foods . . . prolong their original freshness . . . retain their rich nutritional values . . . save their peak fresh flavor . . . days longer than ever before.

And the proof of this great food-keeping improvement is so dramatic that millions will marvel at it!

New in simple beauty, new in basic design, new in appointments of greater usefulness . . . new from top to bottom, this 1939 Frigidaire offers dealers new sales and profit opportunities. Coordinated with this sensational new product are new high-speed selling helps—plus an advertising and sales promotion program as powerful as the appeal of the products themselves. Sweepingly advanced products, streamlined sales promotion and advertising, swift, direct sales strategy . . . everything in the program . . . points to greater sales rewards for Frigidaire Dealers in 1939!

HOW AMAZING "COLD-WALL" PRINCIPLE WORKS



NOW, FOR THE FIRST TIME

1. THE NEW "DEW-FRESH SEAL"—A SOLID GLASS PARTITION—DIVIDES THE CABINET INTO 2 COMPARTMENTS

and

2. THE LOWER COMPARTMENT IS REFRIGERATED DIRECTLY *THROUGH THE WALLS* BY CONCEALED REFRIGERATING COILS.

● This provides all 3 essentials for keeping foods vitally fresh *longer than ever before*—**1. Uniform Low Temperatures. 2. High Humidity. 3. No Moisture-Robbing Air Circulation.** All without adding a single moving part! AND ONLY FRIGIDAIRE HAS IT!

Only Frigidaire Has The Meter-Miser!

Simplest Refrigerating Mechanism Ever Built . . . and when parts aren't there, they just can't use current or wear. Unseen, trouble-free, completely sealed in a permanent bath of oil. 5-Year Protection Plan backed by General Motors.

Only Frigidaire Has Quickube Trays!

Imitated but never equalled . . . Easier to remove—Easier to use—lift one lever and cubes are free, two or a trayful. *Built Sturdier. Faster Freezing. Better Looking.* Compare—and you'll want to sell only GENUINE FRIGIDAIRE QUICKUBE TRAYS.

For 1939 the FRIGIDAIRE Electric Range

COMBINES

Low Cost... High Speed... Sure Results

The Frigidaire Electric Range combines all these "Custom-Built" Features . . . For Low Cost . . . High Speed . . . Sure Results

Every Unit a "Speed-Heat" Unit with 5 Cooking Speeds
Full-Size, Economical "Even-Heat" Oven
Double-Duty "Thermizer"
1-Piece All-Porcelain Cabinet
1-Piece Stainless Porcelain Top
High-Speed Broiler
Exclusive "Evenizer" Heat Distributor
1-Piece All-Porcelain Oven Interior
Non-Tilt Sliding Shelves
Counter-Balanced, Shelf-Type Oven Door
Front Opening Oven Vent
Hydraulic Oven Heat Control
Silver Contact Switches
Armored Wiring
Utensil Storage Drawers

Above Features in every Household Model—Following Features either standard or optional equipment—depending on model selected.

"Thrifto-Matic" Switch
"Cook-Master" Control
"Time Signal"
Warming Drawer
Cooking Top Lamp
Condiment Set

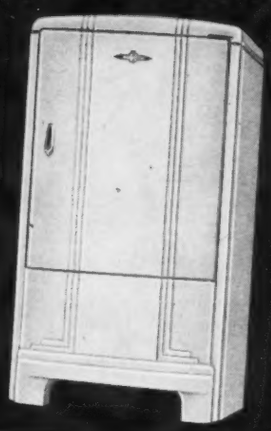
These Beautiful Porcelain Ranges give a wide choice of prices and models.

● In a single year, this marvelous electric range has become one of America's favorites. Designed by 7,550 women . . . practical homemakers who had seen and used all kinds of ranges, the Frigidaire Electric Range combines all the advantages of modern electric cooking to give Low Cost . . . High Speed . . . Sure Results.

No wonder there is so much enthusiasm over the Frigidaire Electric Range. It has proved itself in the field . . . with the dealer, with the salesman, with the consumer. And in 1939, with its new refinements, its additional advancements, with a bold and aggressive sales program it will continue to make records. A comprehensive advertising program in national magazines and newspapers will supplement sales activity. Plans are laid for a big year for 1939. It is not too late to get your share of the fastest growing profit line in the industry!

More Big News For 1939

Frigidaire Announces A NEW LOW PRICE For a Brand-New 1939 . . . Full 6 Cubic Foot GENUINE FRIGIDAIRE WITH THE METER-MISER "Super-Value 6"



SAME Simplest Refrigerating Mechanism Ever Built!

SAME World-Famous Meter-Miser

SAME One-Piece All-Steel Cabinet Construction

SAME finest features of quality and performance . . . as other Frigidaire models costing up to $100 more!

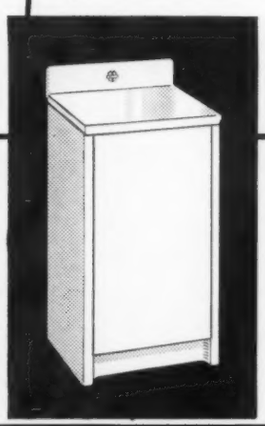
Here is a traffic-builder! A 6 cu. ft. low-price quality refrigerator that will bring *more* interested prospects to dealers' stores. It rounds out the Frigidaire line of refrigerators to give dealers a complete range of models and prices in every competitive field.

Look at this Line-Up of New Frigidaire Models!

6 Cu. Ft. "Super-Value 6"	Dulux Finish
3 Cu. Ft. Model DA	" "
4 Cu. Ft. Model DA	" "
5 Cu. Ft. "Special"	" "
6 Cu. Ft. "Special"	" "
4 Cu. Ft. "Master"	" "
5 Cu. Ft. "Master"	" "
6 Cu. Ft. "Master"	" "
8 Cu. Ft. "Master"	" "
6 Cu. Ft. "Cold-Wall"	" "
8 Cu. Ft. "Cold-Wall"	" "
5 Cu. Ft. "Cold-Wall"	" "
6 Cu. Ft. "Cold-Wall"	Porcelain
8 Cu. Ft. "Cold-Wall"	"
12.5 Cu. Ft. Imperial (2-Door) "Cold-Wall"	"

Every one with the exclusive Meter-Miser

A Size for Every Need and Purpose . . . A Price for Every Budget



New for 1939

Frigidaire "Table-Top" Electric Water Heater

● Newly designed for the vast market that is rebuilding, remodeling and planning new kitchens. It's usable as another working top in the kitchen, in addition to its superb performance as a maker of plenty of steaming hot water. Handsome, gleaming Dulux finish, compactly built to standard height so that it will fit well into any kitchen design. Economical, efficient, durable. Typical Frigidaire and General Motors dependability and long life.

Frigidaire Electric Water Heaters are also available in beautiful upright cabinet models for kitchen or basement installations. Capacities from 30 gals. to 80 gals.

Consistent
with the Western
Spirit of Progress

Reliable

STRAIGHTLINE
DEAD ENDS

Flexible clevis Straight-Thru type FD—A compact and convenient low cost unit.

Long rigid clevis Straight-Thru type LD — Sturdy and easily handled.

Straightline Splice adapter type DD—For economy in stocking.

Rigid clevis type D — Compact and economical.

Reliable Straightline Dead Ends include design features of the Straightline Splice. Straight-Thru type permits easy take-up of slack.

Reliable
ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
3145 CARROLL AVENUE · CHICAGO ILLINOIS

NEW PRODUCTS

Frigidaire Ranges

Frigidaire enters its second year of range manufacturing with five household models, only one of which has legs. Major change in the oven from last year consists of a boost in the capacity of the broiler unit from 2,000 to 2,700 watts, thus increasing the speed of broiling and decreasing the time required to preheat the oven. A specially designed heat reflector immediately above the broiler unit directs more heat rays downward on the food. Two surface cooking speeds have been added, bringing the total to five. A time switch controls the sunken well-cooker, providing for automatic shifting from a new high to low at the end of any period of time from 1 to 30 min. The broiler pan and grid have been redesigned. On large models the height of the work light has been changed.

Frigidaire Refrigerators

Frigidaire salesmen will this year stress the "cold wall" in selling refrigerators. The words "cold wall" mean that the cabinet is separated into two sections by a glass divider which serves as a shelf. Between the sections thus created there is no connection, no air circulation. In the top section is a standard freezing unit providing refrigeration by means of conventional air circulation. Ice freezing thus remains unchanged, and ample food storage space is provided for food not susceptible to rapid drying. Concealed within the walls of the lower section is a series of refrigerating coils, which surround the section, accomplishing the cooling function largely by the radiant principle of heat transfer. Because of this principle, air circulation is materially reduced. This means, says Frigidaire, that food is much better preserved. Even cooked peas will not dry or shrivel. Although the cold-wall cooling coils use the same refrigerant as the upper freezer, there is no mixture of the gases between freezers. Another thing Frigidaire salesmen will talk about this year is a new 6-cu. ft. model designed to sell at a price under $150, a new low price for the line.

Electromaster Range

Deluxe model of the new Electromaster line of ranges introduced last month includes the following features: individual pilot light for each surface unit: lumiline table-top light; combined oven-control clock and minute-interval chime; set of condiment jars; extra large storage space; warming unit; sliding wire basket; non-stain vent; reversible oven rack; 6-qt. Vita-Mizer.

Norge Ranges

The new Norge Electro-Speed plates, standard in all 1939 ranges, are equipped with five cooking speeds. The plates are superfast, the flat covered coils giving direct contact heat which is said to assure more positive head transfer to cooking vessels. The oven features heat control, increased wattage and extra-thick insulation in the top. In most models the broiling unit is equipped with a smokeless grille. One of the outstanding points about the new line is the introduction of a range in the $100 price class which embodies many of the features of the deluxe models.

Norge Washers & Ironers

Norge this year lists five washers and four ironers. It is the company's claim that the washers produce cleaner clothes because a "Steam-Sealer" seals the steam in the tub, keeps hot water hot (heat loss is only 9 deg.) and thus "heat-washes" the clothes. Agitator employed has a down and over action. Transmission of the washers is sealed in a permanent bath of oil and is equipped with a clutch which meshes 20 instead of only 4 or 5 teeth at a time. A holder keeps the extra-long electric cord out of the way when washer is not in use. Norge ironers have two speeds, the higher being three times faster than the slower. Also provided are two roll controls (knee and hand), two heating units, two thermostats and two or more ironing tensions. Temperatures may be regulated from 250 to 450 deg.

Norge Refrigerators

Norge Division of Borg-Warner is this year offering three lines of refrigerators, of which the C/M Synchronizer is most important. Outstanding advantage of this model is that by means of a blend of two refrigerants it is able to deliver temperature of less than 40 deg. and at the same time maintain the relatively high humidity necessary to keep foods in the fresh condition in which they were brought. The two refrigerants are circulated through the compressor and rest of the system as a

(Continued on Page 8)

Frigidaire range and refrigerator

Make way for the OVERLAND STAGE!

This service of supply started back in pioneer days

INDIANS roamed the plains . . . covered wagons and cross-country stages carried pioneers to new homes . . . railroads were just being built . . . when we began serving the electrical industry in 1869. From modest beginnings seventy years ago grew a nation-wide service of electrical supply . . . the Graybar of 1939.

Today, Graybar offers a complete source of everything electrical for every purpose . . . *all* pole-line construction and maintenance materials for utilities . . . motors, lighting and 60,000 other electrical items for industrial buyers . . . a complete line of wiring supplies for adequate wiring . . . everything electrical for homes and offices.

Graybar brings these products to you quickly and conveniently from a nearby warehouse. And it backs every product with its own seventy year reputation for *dependability*.

OFFICES IN 83 PRINCIPAL CITIES, EXECUTIVE OFFICES · GRAYBAR BLDG., N. Y.

IN 1869 GRAY & BARTON
70th ANNIVERSARY
GraybaR
ELECTRIC COMPANY
IN 1939 GRAYBAR

No. 201 N. E. Klein Side Cutting Plier. "Streamlined" for use in confined spaces.

Good workmen demand good tools. In the hands of men who know — everywhere — the pliers are invariably Kleins. Only the keen, hand-honed, perfectly matched cutting knives of Klein Pliers — only the comfortable spring grip in the Klein handles — only the general all around quality that is an inherent part of every Klein Plier can satisfy men whose work demands the best in tools. This, perhaps, explains why Klein Pliers are the standard of quality by which others are judged — why the name Klein has stood for maximum quality, "since 1857."

DISTRIBUTED THROUGH JOBBERS

Foreign Distributor: International Standard Electric Corp., New York

---

The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want:

- ☐ Safety for the Pole Climber.
- ☐ Specifications on Linemen's Belts and Safety Straps.
- ☐ The Safety Factor on Linemen's Leather Goods.
- ☐ Pocket Tool Guide.

Mathias KLEIN & Sons
Established 1857 Chicago, Ill. U.S.A.

3200 BELMONT AVENUE

Norge refrigerator's Handefroster

mixture whose concentration varies at different parts of the system. One important result of this system is that the refrigerator need be defrosted only about one-third as often as usual. Great improvement in defrosting is made possible by a new "handefroster" which supplants the defrosting tray. A porcelain pan above the meat storage tray (immediately below the freezer) slopes rearward and catches the drip from the freezer during defrosting. It carries this through an opening into the handefroster, a glass receptacle at the rear of the shelf below the freezer. The housewife can see at a glance the water line in this receptacle. The device adds over 2 in. of usable space in the food compartment and makes it unnecessary to remove the meat storage tray. Ice compartment on the Norge is completely sealed, thus preventing food odors from reaching the freezer. Door handle operates at a slight touch.

Knife Grinder

For those people (hotels, restaurants, etc.) who have lots of knives to sharpen, the "Kut-rite" knife grinder manufactured by Duwell Mfg. Co. may solve a difficult problem. Duwell says the grinder assures a keen, convex edge. Temper cannot be removed. The appliance, streamlined to the nth degree, houses four abrasive blades and a power unit.

Air Conditioners

Complete line of "packaged," self-contained air conditioning units for commercial establishments has been announced by Westinghouse. The units range in capacity from 1 to 15 tons and in combination up to 30 tons. Three of the units are central-system type; four are the type for installation within the conditioned space. Every unit is small enough to be carried through a 3-ft. doorway. Hermetically sealed compressors are employed in the conditioners. Two switches permit maximum flexibility of operation, one controlling the entire cooling mechanism and the other, the blower motor.

Insulation Tester

An easily-used insulation tester which works up to 2,500 volts has been developed by Ideal Commutator Dresser Co. The device quickly indicates whether there is a short, ground or broken wire. It is especially suited for testing insulation of low-voltage equipment. All current-carrying parts are insulated. Outstanding safety features include a three-wire primary cord, spring-operated cover over high-potential secondary test points and a red indicating lamp.

Mogul Sockets

New line of mogul sockets with a high-quality switch mechanism for two filament mogul lamps has been announced by Arrow-Hart & Hegeman Electric Co. These sockets have a snap switch action and operate high, medium, low, off or low, medium, high, off. Socket bodies are supplied either without hickeys or with 1-in. hickeys. Separate hickeys are available in four different heights to meet various mounting requirements. The round turn knob key is removable for easy assembly in lamps.

Low-Voltage Protector Tube

A gas-filled protector tube designed for indoor service has been developed by Westinghouse to protect supervisory control line wires and telephone lines from over-voltages caused by lightning and direct contact with or induction from nearby power lines. The protector is of the discharge-gap type with the gaps enclosed in a glass bulb containing inert gas at low pressure. Gas used is easily ionized and provides a current-carrying path of 50 amp. for two seconds. Where induction is especially severe, the line wires may be continuously grounded through suitable transformers in conjunction with the protector units and all dangerous induction drained off directly.

Induction Regulator

An induction voltage regulator announced by General Electric can be applied to installations of all types, indoors and out, without control or supply connections of any kind, and without interconnections between regulators. The new regulator supersedes the standard G-E outdoor and indoor types, in ratings of 36, 48, 60 and 72 kva., single-phase, 60 cycles, 2,400 volts and 4,800 volts. The unit is shipped oil-filled. No lubrication is required. To place the regulator in service, only three main-line connections need be made.

Portable Test Meter

New portable test meter, announced by Sangamo Electric Co., is especially adapted to the accurate and efficient testing of watt-hour meters or the capacities usually employed in residential service. Separate current terminals are used for each of three current ranges—1, 5 and 15 amp. Features of the meter are: minimum size; light weight; the use of a silver-contact potential switch; a spring-operated lower jewel bearing. The straight-line accuracy and ample current-carrying capacity for twice the rated load of the meter is said to assure superior accuracy.

Bus Support

Recent refinements in the design of a Burndy Engineering Co. bus support (type UH) include the following: Interlocking teeth have been provided on the neck, thus permitting the tubular bus to be set at an angle to the steel structure. Finer adjustments than are obtainable through use of interlocking teeth may be made by means of slightly ovalized bolt holes in the base. The tube clamping members are so arranged that either a tight fit or a slide fit may be obtained.

Clamp-Ammeter

New bakelite-encased a.c. clamp-ammeter, announced by Weston Electrical Instrument Corp., combines six ranges in one instrument and will measure current flow through insulated or non-insulated conductors up to 2¼ in. in diameter. The instrument is equipped to measure low as well as high values. Actual full scale ranges are 10, 25, 50, 100, 250 and 500 amp. With a single conductor through the clamping jaws, current values from 1 to 500 amp. can be conveniently read. Additional lower ranges may be secured by passing the conductor through the split-core transformer (clamping jaws) two or more times. The clamp-ammeter is designed to be used at all commercial frequencies. When used at frequencies between 50 and 70 cycles, accuracy is guaranteed by Weston at 3% or better.

Hand Lamp

Big Beam is a super-power, portable storage-battery hand lamp which will cast a light over ½ mi. distant and will burn ten consecutive hours on one full charge of its battery. An auxiliary bulb operated by an independent switch will burn 60 continuous hours. The lamp is especially designed for linemen. U-C-Lite Mfg. Co., the maker, claims two exclusive features for the lamp: (1) A rubber reservoir, which seals in the battery vents,

collects any fumes and prevents spillage, thus eliminating corrosion of terminals and protecting the clothes of the lineman; (2) the simplicity of recharging the battery through the lamp head without removing the battery from its case. With a dash-board type of switch the user can charge the battery direct from the charging system of a truck.

Mining Cable

Electrified surface mining operations in high altitudes are hard on rubber-covered cables. At 10,000-ft. elevations rubber deteriorates rapidly under the actinic rays of the sun. Frequent temperature changes from the heat of the day to the cold of the night also take their toll. To meet these conditions, Anaconda has developed "Sunex Securityflex"—a covering resistant to heat, moisture, alkali and acid—to protect all Anaconda mining cables. This is made in all types of cords and cables for every purpose. Anaconda claims that while six-months' depreciation in tensile strength for untreated stock is 10%, for their cable it is 3%. Sunex has high resistance to damage by impact, cutting and crushing. Its long retention of a smooth surface insures safe handling and elimination of shorts.

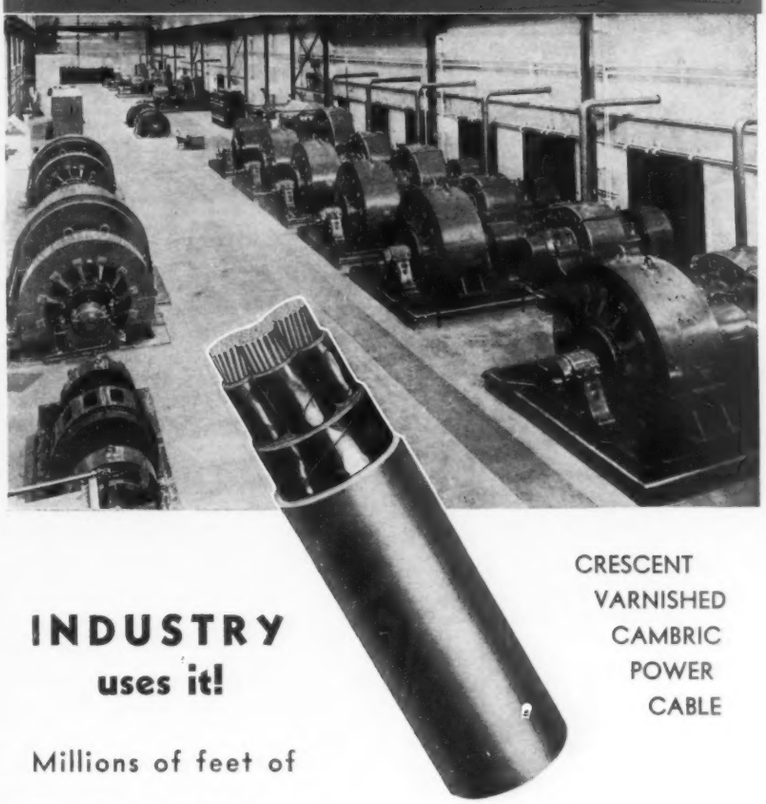
Vernier-Set Timers

New Vernier-set timers introduced by Automatic Temperature Control Co. provide accurate and visible timing adjustment. This is possible because use of the Vernier principle

(Continued on Page 10)

RUBBER COVERED POWER CABLE • BUILDING WIRE
CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE
VARNISHED CAMBRIC • FLEXIBLE CORDS • LEAD ENCASED AND PARKWAY CABLES • ARMORED CABLE

CRESCENT
INSULATED WIRE and CABLE



INDUSTRY uses it!

Millions of feet of Crescent cables for power, light and control have been installed in industrial plants for the last fifty years with an enviable record for DEPENDABLE SERVICE.

CRESCENT VARNISHED CAMBRIC POWER CABLE

ADEQUATE WIRING SERVES AND SAVES

CRESCENT
INSULATED WIRE & CABLE CO. INC
TRENTON, NEW JERSEY

WESTERN REPRESENTATIVES

LOS ANGELES	SAN FRANCISCO	KANSAS CITY
Henger-Seltzer Co.	Hodges & Glomb	W. F. Howe & Co.
130 S. Hewitt St.	1264 Folsom St.	2627 McGee St.

CRESCENT ENDURITE SUPER - AGING INSULATION

Crapo
GALVANIZED PRODUCTS
Steel Strand
Telephone and Telegraph Wire
Where strains and stresses are heaviest, where corrosion takes its greatest toll, Crapo Galvanized Steel Strand and Telephone Wire constantly are proving their outstanding superiority. The heavy, tenaciously bonded zinc coating, maximum tensile strength and correct ductility insure longer life and lower maintenance cost. Insist upon Crapo Galvanized Products for better performance under all conditions! Ask your Jobber or write direct!
INDIANA STEEL & WIRE CO.
MUNCIE, • INDIANA
Crapo Galvanized Strand and Telephone Wire can be obtained readily in all standard grades and sizes.
INDIANA STEEL & WIRE CO.
MUNCIE, IND.

permits the time cycle to be set to within a split scale division. The desired adjustment is maintained with no locking device required. With Type 2803 timer, four arrangements of load circuits are possible. The desired load-circuit condition is selected by simple adjustment of two slides, movable to left or right, and by the location of bridge connections. These load-circuit changes are readily made without tools and without dismounting the timer. Five silver contacts carry 30 amp. at 110 volts a.c. The timers are especially applicable to various industrial operations and processes.

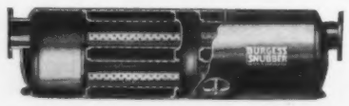
Weatherproof Transformers

Two new types of weatherproof transformers for use with high-intensity mercury lamps have been added to Jefferson Electric Co.'s line. They are assembled in heavy one-

piece drawn copper-bearing, weather-resistant steel cases filled with a high dielectric, waterproof compound of great heat conductivity. Accompanying illustrations show one of these pole-type transformers with lamp fixture mounting support; the other shows a standard indoor type. All connections in the pole-type units may be made at the mast-head adjacent to the mercury lamp.

Exhaust Quieter

New type of noise-quieting device which is non-acoustic and can be placed at any point in the intake or exhaust system of an engine or compressor has been developed by Burgess Battery Co. Two aero-dynamic effects are involved in the operation of the device, known as the Snubber. First, the fast-moving slug of exhaust gas, which is vented into the exhaust system, is trapped in a high-resistance snubbing tube. This tube is perforated radially to allow the pent-up gas to vent gradually into the first snubber chamber. At the



same time, a recoil pressure from the snubbing tube serves to slow up the flow of scavenged gases and thereby prevents pressure dropping below atmospheric pressure. The slower moving scavenged gases do not enter the snubbing tube but are diverted through a low-resistance exhaust tube in the first chamber. A second stage of snubbing, comparable to the first, removes any remaining impulses which may be present in the exhausted gases. Effect of the Snubber is to prevent the sudden impact of the slug of vented gas with the atmosphere and also to stop the usual inrush of air into the exhaust pipe after the discharge of the slug.

Tap Clamps

Fifteen years of clamp-making experience have gone into the construction of the Perma-Grip tap clamps manufactured by Tips Tool Division of A. B. Chance Co. Current-carrying capacity of each clamp is in proportion to that of the maximum jumper wire for which the clamp is designed. Tests are said to reveal a minimum yield point of 165 in.-lb. and an ultimate strength in excess of 260 to 500 in.-lb. (depending on size) applied torque on the eye screw. The gripper is designed for three-point contact with the conductor. Another clamp, the Tips Snap-Tap, provides a strong permanent connection and a rapid "disconnect." It is applied to the line with a quick snap effect using any Tips clamp stick and is tightened by turning the eye screw. The jaws of the clamp will take conductors ranging from No. 8 solid copper to 4/0 stranded copper. It is made in three types for aluminum to copper, copper to copper and general purpose connections.

Pothead

A new G & W Electric Specialty Co. pothead—Type T outdoor capnut, single conductor, 7,500 volt, 250 and 500 amp.—has the following features: (1) Solderless clamp-style internal and external connectors using a separate clamping plate which accommodates one range of conductor sizes in one position and another range of conductor sizes with the clamping plate reversed. (2) The external lug is so designed that the aerial conductor can be clamped vertically or horizontally merely by turning the clamp plate 90 deg. (3) The base-sealing fitting is a stuffing-box style using oil-proof molded rubber-squeeze bushing. The hole in this bushing need only be varied for different cable diameters.

Fire-Hose Nozzle

To date it has been impossible to use fire hose on fires in live electrical circuits of even moderate voltages because the ordinary hose stream conducts electricity and the operator is liable to receive a severe shock. This difficulty can now be gotten around, however, by use of the Poweron nozzle made by American-LaFrance-Foamite Corp. Tests show that the nozzle is effective in fighting all kinds of fires and is therefore valuable in protecting properties where electricity is a factor. The Poweron nozzle is similar to the ordinary nozzle in appearance and can be attached to any standard hose. Its special discharge forms a water curtain between the operator and the blaze. The nozzle is non-adjustable, which prevents the formation of either a solid stream or an ineffective spray.

PRODUCT DATA

Free to you . . . Any of these instructive bulletins simply by addressing a post card to ELECTRICAL WEST and asking for the desired bulletin by number.

301:

SYNCHRONOUS MOTORS and gear motors come in for their share of attention in three booklets recently published by Westinghouse. The first, entitled "Simple Facts About Synchronous Motors," is written in layman's language. It tells how to select the proper synchronous motor for an application and shows the advantages of synchronous motors. Application data, including the more important motor applications and their typical torque requirements, are listed for various installations. "Westinghouse Geared Drives" is the second booklet. It explains, entirely by means of pictures, the

(Continued on Page 12)

You Can Make Money At Kelvinator's
BIG BIRTHDAY PARTY!

CUT YOURSELF IN

on this biggest Refrigerator selling event in 25 years — Kelvinator's Silver Jubilee Celebration!

EXPERIENCED MERCHANDISERS—department store executives—dealers who know what it takes to get store traffic—appreciate the sales value of special events. Experienced merchandisers are saying, "This Jubilee of yours means business for us."

Every Kelvinator dealer and distributor is getting ready to cash in on the big celebration . . . with its six-day Birthday Party . . . brand-new promotional material . . . live-wire local cooperative advertising and free gifts!

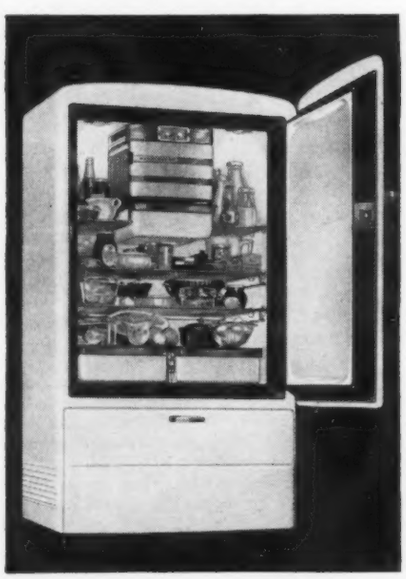
This is going to be the "hottest" sales promotion of the year. Behind it is the story of the first successful refrigerator and the latest Kelvinator models . . . the story of improvement after improvement that dates back to the very first electric refrigerator.

Watch the crowds during Kelvinator's Silver Jubilee Week, April 3rd to April 8th. Many Kelvinator dealers and distributors plan to give away free gifts and special frozen desserts to celebrate the occasion.

Behind it is the new 1939 Kelvinator line, with more new features to talk about . . . *more new features to sell* . . . with new *low* anniversary prices that will make Kelvinator the "value" line of the year.

Behind it is the practical, effective sales training program of the Kelvinator National Salesmen's Institute, turning lookers-around into buyers, demonstrations into sales, store traffic into profits.

All this means that 1939 is going to be Kelvinator's big year . . . *your* big year, too—if you include Kelvinator in your plans. Don't just wish you had—get your share of the profits now. IT'S NOT TOO LATE!



Perfected Product of a Quarter-Century!

TODAY, Kelvinator adds a fitting climax to its first 25 years of pioneering . . . by introducing the new Silver Jubilee models . . . modern . . . beautiful . . . sensational . . . as revolutionary as the first Kelvinator that introduced electric refrigeration.

These new "selling features" give you the opportunity to make 1939 a volume year for you and your salesmen.

NEW! Conditioned Cold—the latest refrigeration discovery . . . flavor protection in special compartments for meats, vegetables, and frozen desserts.

NEW! The Polarsphere—considered the most efficient cold-producing unit made. Completely sealed in a welded steel ball . . . produces cold power enough for five refrigerators.

NEW! "Family Planned" interior . . . shelving arranged to end groping and fumbling. New wider front, less depth, more storage space.

NEW! Vegetable Bin. Dry storage for nearly two bushels of onions, potatoes, squash, etc. Tilts open easily. Attractive chromium type handle.

Kelvinator, Division of Nash-Kelvinator Corp., Detroit, Michigan.

Silver Jubilee KELVINATOR

BE IN THE SPOTLIGHT WITH KELVINATOR IN 1939

BECAUSE the nut swings out of the way for installation and hinges back into place in perfect alignment with the threads—thus the nut starts more easily on the bolt—just another good reason to use Blackburn One-Piece Connectors.

JASPER BLACKBURN PRODUCTS CORP.
Main & Clinton Sts. ST. LOUIS, MO.

JEFFRIES

TRANSFORMERS

Save Their Cost and Pay Dividends by—

1. Elimination of duplicate conduit runs.
2. Saving in power rate.

(Put all of your 110-volt equipment on a 220-volt or 440-volt power circuit, it is economical.)

JEFFRIES TRANSFORMER COMPANY
5706 Long Beach Ave. Los Angeles

uses, adaptations and developments of all types of geared drives. Special emphasis is put on the quarry, textile, pulp and paper, coal, steel and petroleum industries; but other industries using electric power are included. "Westinghouse Gearmotors" is the third and shortest booklet. It illustrates and lists as available the following types: single-reduction gear motors, with standard gear ratios up to and including 5 to 1; double-reduction motors, with standard ratios 5.6:1 to 10:1 inclusive; double reduction motors, with standard ratios 11.2:1 to 40:1 inclusive, and triple-reduction motors with standard ratios 45:1 to 200:1 inclusive. In asking for No. 301, specify which publication you want.

302:

RECTIFIER DIVISION of Allis-Chalmers has issued a leaflet covering the small capacity, permanently evacuated, glass-bulb rectifier units recently put on the market by the company. It deals with many advantages inherent in such equipment for use in small traction systems, industrial plants with moderate d.c. power requirements and large buildings affected by d.c. to a.c. change-overs. In addition to comparative efficiency curves, the leaflet includes typical wiring diagrams. Write for bulletin No. 302.

303:

BIGGEST and most elaborate catalog of the month is Delta-Star Electric's. It's entitled "Bus & Cable Connectors" and boasts 168 pages of facts, figures, descriptions and illustrations. In the back of the book are several pages of valuable engineering reference material. Ask ELECTRICAL WEST for 303.

304:

CATALOG No. 2 describes Emerson Electric fans for 1939. Nearly a hundred types, including desk and stand fans, air circulators, ceiling fans, exhaust and ventilating fans, are listed. Seven new models are also mentioned. Write for No. 304.

305:

THIRD CATALOG is quite prosaic looking, but it contains information every rural electrical man can use. Publisher is Lyon Rural Electric Co. Listed and fully described are all kinds of brooders, heaters, thermostats, insect killers, alarms, incubators, etc. If rural electrification is your field, by all means ask ELECTRICAL WEST for bulletin No. 305.

306:

CARRIER CORP.'s catalog presents air conditioning equipment for the many uses from a single room to an entire building. Refrigeration and heating equipment are included. Each type of product is described according to application, function, advantages, operation, installation, dimensions and sizes. Write for No. 306.

307:

BY NO MEANS all of Schaefer Bros. Co.'s full line of electrical control equipment is listed in the company's new catalog. A brief foreword stresses the fact that the firm can manufacture equipment to suit special needs. Nevertheless, the catalog does list a lot of equipment; and it does so without the usual flamboyant boastfulness. If you want more information on Schaefer's line, write ELECTRICAL WEST for 307.

308:

CONDENSED 8-PAGE booklet giving general information on NEMA standards and definitions has been prepared by Louis Allis Co. The booklet includes suggestions for the proper selection of motors, types of drives, various types of protected motors and their definitions; information regarding service factors, rated loads, torques and other important reference material that should be in the files of men who buy, specify or maintain electric motors. Write for bulletin No. 308.

309:

THIS BOOKLET, says General Electric, describing its "What Every Plant Operator Should Know About Metal-Enclosed Switchgear," answers many questions: What different types of switchgear are available? Their applications? What are the voltages and interrupting ratings? What is the difference between "metal clad" and "metal enclosed?" etc. Answers are given in crisp captions to the numerous illustrations. It takes about five minutes to read the whole booklet; but by the time you're finished you know what metal-enclosed switchgear G-E is offering. If this is information you need, ask for ELECTRICAL WEST bulletin No. 309; General Electric publication GEA-2872.

310:

POWER CABLE FAULTS are being located in minimum time with the Morse-Newhall Test Assembly, a modification of the Murray Loop Circuit, now being manufactured by Leeds & Northrup. Operating at very high voltages, the assembly eliminates the necessity for breaking down fault resistances. A long spiral slide-wire assures high accuracy so that faults are usually located after a single measurement. Easily portable, one equipment can cover a wide territory and can materially reduce line-maintenance costs. Further information is given in a 4-page bulletin by the company. Do you want it? Then ask for No. 310.

NEW BOOKS

Electron Tubes

"Theory and Application of Electron Tubes," by Herbert J. Reich; McGraw-Hill Book Co., Inc., available at McGraw-Hill book room, 883 Mission St., $5. A book, primarily for students, intended to present thorough grounding in fundamentals. No attempt is made to discuss old applications to special problems, but basic principles and typical applications are discussed. Neither are Class C amplifications for radio design taken up. The basic principles, however, are applicable to radio engineering as well as general electronics. The book comprises 670 pages and, with the exception noted, is especially thorough in its treatment of all phases of the subject.

Engineers' Manual

"The Engineers' Manual," by Ralph G. Hudson; John Wiley & Sons, $2.75. This second addition includes revisions of the entire chapter on heat and a large part of the chapter on electricity. It also contains revision of tables of physical constants, new steam tables, etc. Like the first edition, it attempts to achieve accessibility of material in concise form, so that an engineer may obtain references quickly, even when working in a field with which he is not especially familiar.

Selling Ideas

"Sam's Selling Slants," by Vernon "Sam" Vining, department store sales manager, Westinghouse Electric & Mfg. Co.; published by Prentice-Hall, Inc., $1. The electrical industry's most spectacular and dramatic salesman puts into pithy sentences some of his soundest philosophy. Those who have heard Vining will live again in memory the vividness of his dramatization. Those readers who haven't will get a homey, useful slant on selling.

PRINT IN BINDING

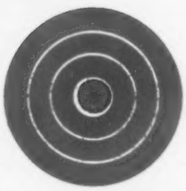
CHROMALOX

again demonstrates

RANGE UNIT LEADERSHIP

The RIGHT HEAT . . . for every cooking operation

The RIGHT SIZE . . . for every cooking utensil

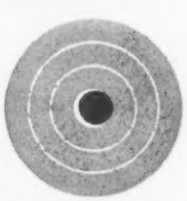


HIGH — *all three rings energized. Pale red color is used to illustrate operation — but Chromalox units do not glow red in service. They are designed to transmit heat by conduction (contact).*

MEDIUM — *two rings only energized, giving approximately 3/4 of High heat distributed as illustrated.*

CENTER — *middle ring only energized, permitting the use of small utensils with maximum efficiency and economy — the exclusive Chromalox "two-units-in-one" feature.*

LOW — *reduced wattage over two rings only, giving approximately 1/6 of High heat.*



SIMMER — *all three rings at low intensity, giving 1/16 of High heat.*

Outstanding and exclusive advantages — attributes which have made Chromalox units preferred equipment among range builders, utilities, electrical dealers, and the vast army of range users — are more pronounced than ever in the new Chromalox Super-Speed, *3-ring,* 2000-watt unit. Designed for 5-heat operation, it surpasses even traditional Chromalox performance by giving uniform heat distribution over the bottom surface of the cooking utensil in *four* switch positions, with a medium heat approximately ¾ of High heat.

Chromalox units for 5-heat operation — four sizes in the two-ring type and this new three-ring type — give you a powerful addition to the many other Chromalox sales-building factors. Study the drawings on the left, showing the three-ring unit. Note how these five heats are attained, also how provision is made for Chromalox "two-units-in-one" economy in the use of small utensils — the big saving feature which only Chromalox can offer.

Here, then, is the range unit of today — the same fast-cooking, flat-topped, easily cleaned Chromalox unit which has made electric range history, with added flexibility, increased speed, greater potential savings . . . and intensified appeal to every range user.

The series of Chromalox Super-Speed units for use with 5-heat switches consists of four standard sizes in the two-ring construction — 1000 watts, 1200 watts, 1500 watts and 2000 watts — and the new 3-ring, 2000-watt unit illustrated.

EDWIN L. WIEGAND CO. • 7540 Thomas Blvd., Pittsburgh, Pa.

Write us or our nearest representative

MONTGOMERY BROTHERS

911 Western Ave., Seattle, Wash. • 1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Cal. • 912 E. Third St., Los Angeles, Cal.
THE PETERSON COMPANY • 1921 Blake Street, Denver, Colo.

ELECTRA'S HUSBAND

Steinmetz Saw It Coming

"YOU used to be quite a student of Steinmetz," said Electra one rainy night recently. "Isn't that right?"

The way she said it should have made me suspicious, but I walked right into her parlor.

"Yes indeed," I answered, "When I was studying E. E. He was one of the greatest mathematical minds in our industry—in our time for that matter."

"Yes, I remember those books full of unintelligible formulas you carried around when we first went together. What do you think of his social theories?" She made the thrust.

"Social theories? I never read them, but I understand the old boy was a bit radical."

"Too bad your industry didn't pay as much attention to some of his thinking along those lines as you did to his mathematics. You might be better off today."

"So—you think that socialist stuff is what we need—"

"Just a minute." Electra's voice hardened. "You haven't read your Steinmetz. His brand of socialism was not what you imagine it to be. He believed in corporations as the ultimate form of efficient management of society. He also focused his analytical old eyes on quite a few of the weak spots. Here, refresh your memory with this little book he wrote way back in 1916."

With that she handed me a compact little volume, "America and the New Epoch."

Immediately I was fascinated to see Steinmetz' familiar mind at work, analyzing not transformer characteristics and high-voltage phenomena, but the equally complex economic history of the world which he reduced to such simple terms.

I saw history in a new light, the glory and the shouting only the facade for great economic and social changes. The French revolution was revealed as the destruction of the feudal system and the birth of capitalism. I saw the World War as the attempt of inefficient, industrially unorganized England and France to end an unequal battle for world markets with the highly organized, socially developed Germany. Although the book was written in 1916, in the midst of that war, it was easy to project the effect of such forces into the years after the war and to understand better what is going on in Europe today.

Naturally what interested me most was the development of Steinmetz' ideas respecting America after the frontiers had been conquered and readjustments forced upon us—things he could only predict from the trends he observed before 1916.

OF course it was easy to see the socialist trend of his thoughts, but his was a far more realistic idealism than mere government ownership and operation. In fact, he envisioned trouble if the evolutionary process in America broke down and political control of industry displaced the growth of true cooperation through the growth of the corporation form. His experience in a well managed corporation led him to feel that the corporation was the form needed for efficiency and accomplishment of the social requirements of the people. He hoped that corporation managements would be alert to their social responsibilities and that the evolution of our system would be made through them rather than through politicians.

As I read I could not help thinking how far we have swung away from that evolutionary path in the last few years. In the Administration's first days, when NRA was put forth to organize American industry, the Steinmetz pattern was still being followed. But since then the pendulum has swung far to the political side. Let me quote two passages which might have been written yesterday, they are so pat to the situation.

"And so throughout the entire field of industrial production, our government, backed by public opinion, is still 'trust busting,' while all other civilized nations are organizing their industrial production.

"But the industrial corporation was to a large extent to blame for the growth of this hostility; it was self-centered, self-satisfied, appreciating too little the effect of public opinion, the hostility which arises from the use of secretive methods, and the advantage of explaining its action to the public."

Further on he wrote—

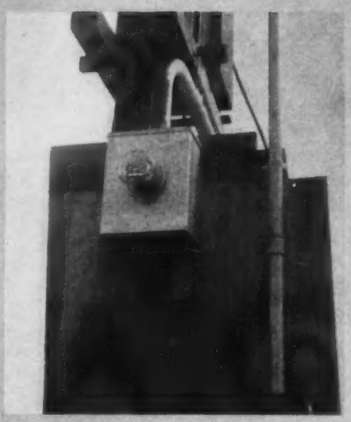
". . . what then, if industrial unity cannot be established; if our industrial leaders, our political leaders, fail to grasp the opportunity of insuring the masses of producers against unemployment, sickness, old age, and if indifference, antagonism, and industrial strife remain, or if we fail to realize the immediate importance and urgency of bringing about better relations, and things continue to drift? The corporation would accomplish little, if anything, in industrial reorganization, as it would not be supported from within, its employees, nor from without, the general public. The demand for the political government to step in, which already is strong and general, would naturally increase. The political government—municipal, state and the federal government—would take over more and more industrial activities; supervision of the railroads by an interstate commerce commission, extending into control, and finally administration and ownership of the railroads would follow; the same action would extend to all other means of communication, as telegraph, telephone, etc. Industrial supervision and control by an interstate trade commission would come, entering more and more into the internal economy, direction, and finally operation and practical ownership of industries. Simultaneously therewith an extended governmental activity in the ownership and operation of canals, reclamation works, mines, steamship lines, shipyards, farms, etc. The final result thus would be an industrial reorganization of our nation by the political government, the federal government superseding the industrial corporations.

"HOWEVER it would require an entire change of our governmental system, the creation of a strong centralized government, like that of many European nations, the introduction of decentral methods of dealing with progress and development. This would be possible only by a change of our national temperament from democratic to monarchical—that is from individualistic to collectivistic. . . ."

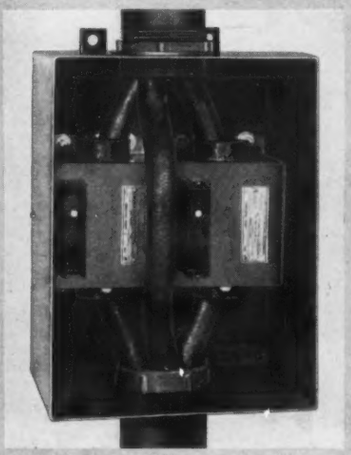
Electra was probably right, though I wouldn't admit it to her. We might have listened to Steinmetz a little more on this score, as well as to his mathematics. I wonder if it is too late yet?

INSTRUMENT TRANSFORMER

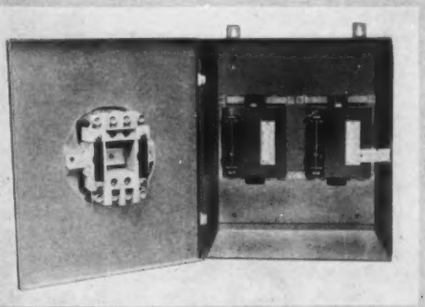
NOW MATCHES MODERN METERS...IN ACCURACY... FLEXIBILITY...CONVENIENCE



METERING LOAD AT MIDWESTERN OIL FIELD
This one compact unit meters loads from 60 to 1200 amperes. Slack time or peak load, this unit correctly measures current consumed.



Two FW Current Transformers are mounted in aluminum box. Each has accurate range from 60 to 1200 amperes. Line passes through knockout in box, then through transformers—no primary connections required.



Standard 5-ampere Westinghouse Meter and socket mounted on box cover, with connections from transformer secondary to meter socket.

For the simplest metering of heavy loads

use the Westinghouse FW Current Transformer. Great overcurrent capacity permits highly accurate metering over a wide range of loads. This wide-range accuracy, as well as the small size of the FW, is made possible by the exclusive Hipernik core.

Only two sizes required: 200/5 for a load range of 20 to 400 amperes; 600/5 for a load range of 60 to 1200 amperes. Good for circuits up to 1000 volts. Less stock to carry, smaller investment.

THE FW INSTRUMENT TRANSFORMER BRINGS YOU THESE 5 ADVANTAGES

1. Wide-range accuracy—from 10% of rating to 200% rating.
2. One transformer handles either 2-wire or 3-wire single phase service.
3. Small, light, compact, easy to install.
4. Safe—no primary connections, and low open secondary voltage.
5. Flexible, economical, portable.

Feel free to ask any Westinghouse office for information about high current metering — with extreme accuracy, yet at low cost. Experienced men are ready to help you.

J-70178

Westinghouse Transformers

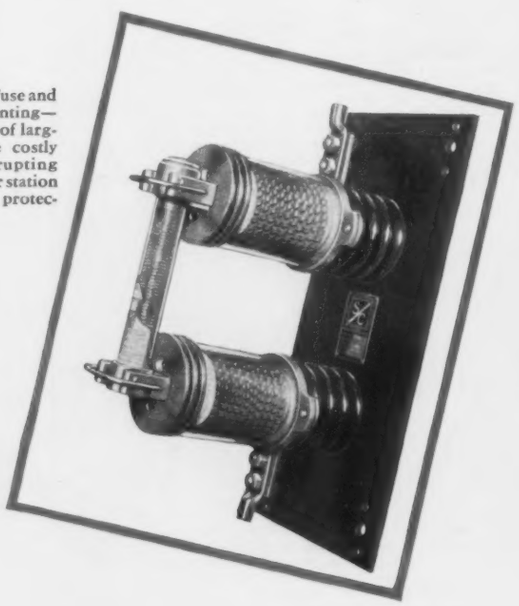
The S & C label is your guarantee on fuses, cutouts, fuse links and other protective equipment.
S
A
N
D
C
For high voltage systems—68 to 138KV—S & C Liquid Fuses with corrugated Pyrex glass have 30% greater insulation to prevent dangerous flashovers under high recovery voltage conditions.

2300 V to 138000 V

S & C Fuses Always Get the Hard Jobs

With systems each year demanding a higher and higher degree of reliable protection—experienced engineers make S & C Liquid Fuses their choice . . . . Each year gives further proof of the value of S & C experience and performance.

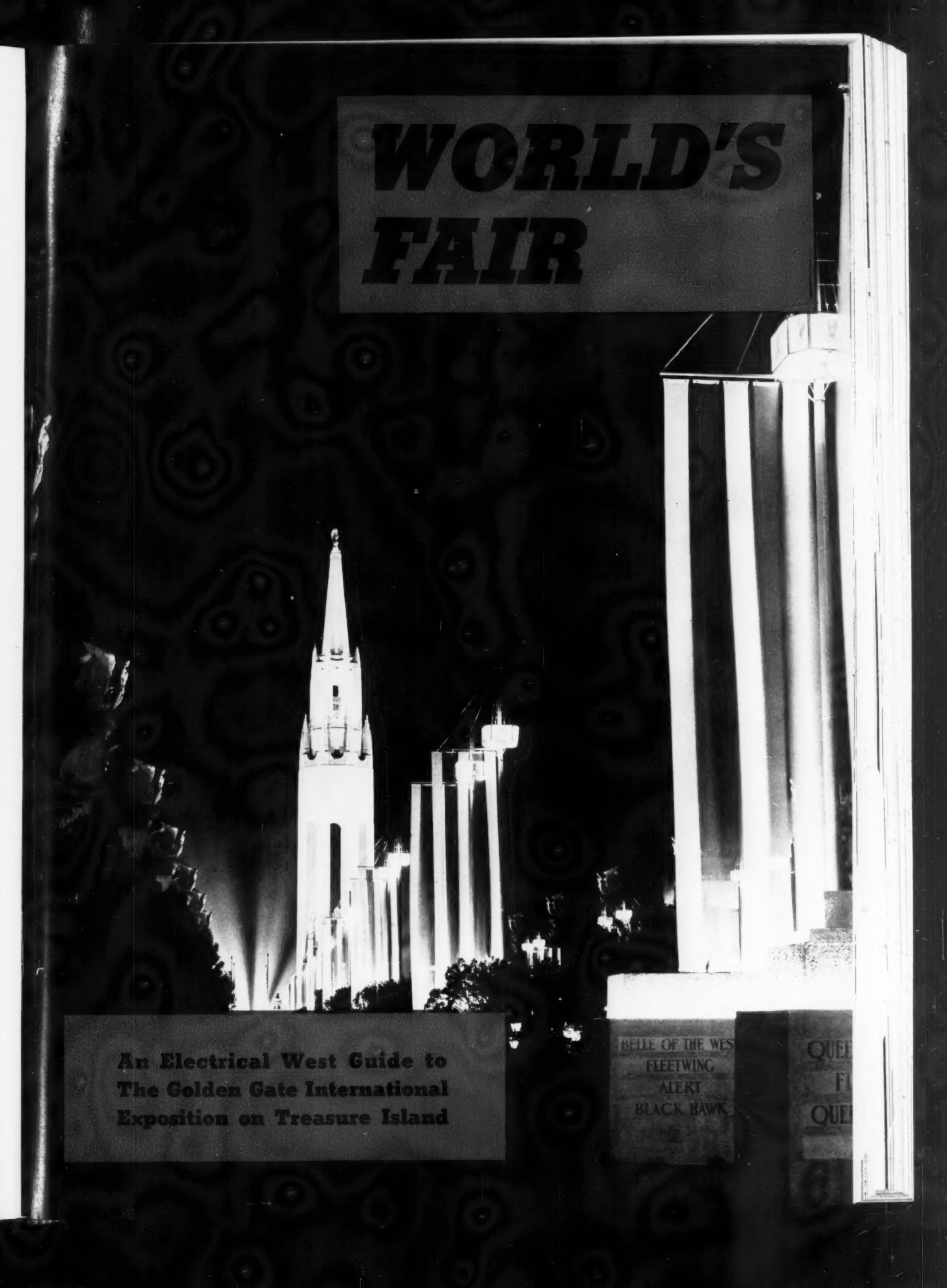
Whether for feeder circuits from 2300-volt substations—or 138,000-volt stations or transmission lines—you can be sure of the utmost in protection with dependable S & C Fuses! Your system deserves all that these fuses can provide.

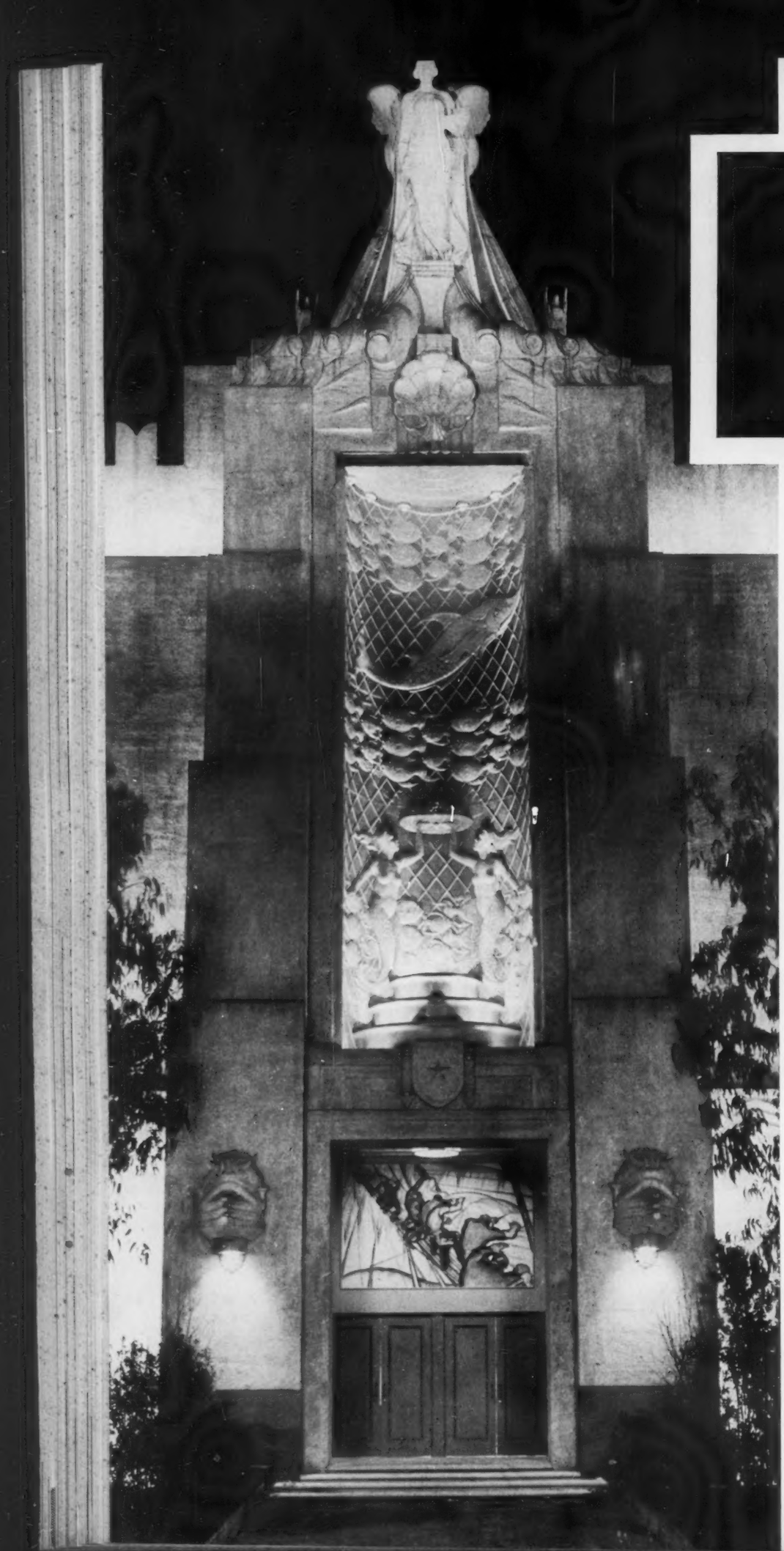


S & C Liquid Fuse and Resistor mounting—used in place of larger and more costly circuit interrupting equipment for station transformer protection.

Slotting of the ferrules is a recent improvement on sizes 4 and 5, to provide greater heat radiation and further increase the reliability of the fuse.

SCHWEITZER & CONRAD, INC.
4435 Ravenswood Ave., Chicago, Ill.
Manufactured in Canada by Powerlite Devices Ltd., Toronto, Ont.
EXPERIENCE WILL CHOOSE THE S & C FUSE


WORLD'S
FAIR
BELLE OF THE WES
FLEETWING
ALERT
BLACK HAWK
An Electrical West Guide to
The Golden Gate International
Exposition on Treasure Island



WESTERN PAGEANT

Its special significance to those in the electrical industry of the West

WORLD Fairs are preeminently electrical. This has been so since the first arc light was introduced at the Columbian Exposition in Chicago in 1893. But the Golden Gate International Exposition on Treasure Island in San Francisco bay, which opened on schedule, Feb. 18, for its initial 288 day run, has four-fold significance to those engaged in the electrical industry in the West.

First, it promises a nationwide awakening to the possibilities and resources of the West, an awakening too, to its existing markets, facilities and development.

Second, it should bring a realization of what Pacific Ocean and South American countries can and do contribute to the future of the West and to America.

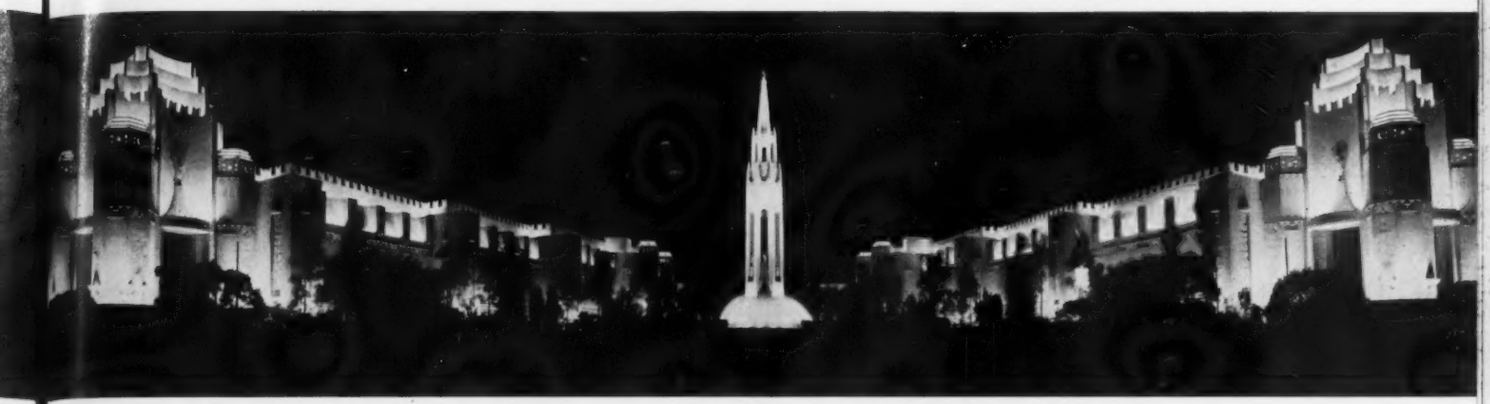
These are the broad, long range aspects of the Fair and its meaning to Westerners in the electrical business. Of more immediate practical value are two more.

Third, the exposition is a lighting exhibit of infinite variety in methods, techniques, and effects.

Fourth, it is a source of ideas and suggestions for display and advertising, for lighting effects and electrical usage that should stimulate business and construction.

Of the latter these pages will prove an index of such lighting techniques

A new lighting technique—bas-relief murals in fluorescent paint, luminesce energized by 250-watt "black light."



Court of the Moon, in blues of fluorescent and screened Mazda, its fountain lighted by amber underwater units

and where they may be found. Necessarily it is incomplete, for the fund of such ideas and uses is almost infinite if a visitor will devote the time to a thorough examination of exhibits and buildings. To the typical engineer who has a perpetual, "how is it done" attitude, the Fair brings into one concentrated center the widest possible variety of both devices and techniques. He may not approve the result, but he does have the opportunity actually to see it and compare it with others close by. New light sources, new materials, too, are used more lavishly than otherwise would be the case and their possibilities further developed and explored.

Before the first week more than half a million people had swarmed through the turnstiles, giving assurance that estimates of attendance will be amply realized. What this means to the electrical industry is that several million of its ultimate customers will be stimulated to use and to try some of the new lighting and electrical applications they see. A Fair is a forecast of "the shape of things to come." It can be capitalized as such by the industry.

Of that first significant value of the Golden Gate International Exposition, that of awakening the nation to the West, a substantial beginning has been made. A Fair like this is a medium of widespread publicity. Not alone the publicity department of the exposition, but the press, the wire services, radio, magazines, the railroads, bus and air lines, each of the large scale exhibitors will be telling of the Fair in numberless ways. Even the counter attraction, New York World's Fair, by reason of the competition and the comment it arouses, will stimulate a healthy reflex interest in the World's Fair of the West.

Each of these media and interests will exploit not alone the Fair but the West, its scenic attractions, its cities and industries, its farms and products, its resources and future. Every visitor from the East first must pass through a good deal of the West to reach the Fair, and many will visit many cities and attractions.

In anticipation of this value of the Fair to the West a cooperative movement has been organized under the title, "Industrial West," which shall seek to consolidate and follow through the industrial and business interest created in this region as a result of the Exposition.

Around a large-scale relief map designed to indicate the industrial resources of all parts of the 11 Western States, the exhibits of those same states are to be found. Thus the bird's eye view is immediately related to the products and the individual resources of these states. A continued program beyond the Fair is planned to translate these opportunities into industrial realities for the further development of the West.

Of this development electricity will share generously. The long range planners within the electrical industry are making ready to convert this value of the Exposition into business for tomorrow.

Second long range value of the Golden Gate International Exposition is to be found in the representative group of buildings and exhibits just East of the main exhibit palaces—the Pacific Basin section of the Fair. It is this group that gives to "international" a new and quite distinct flavor. Arranged around a lagoon that is an extension of that in front of the California and the U. S. Government group, are the buildings and exhibits of Japan, Australia, New Zealand, Alaska, French Indo-China, Java, Netherlands East Indies, Jahore, the Philippines and Hawaii, and the Latin Americas — Brazil, Argentine, Peru, Chili, Ecuador.

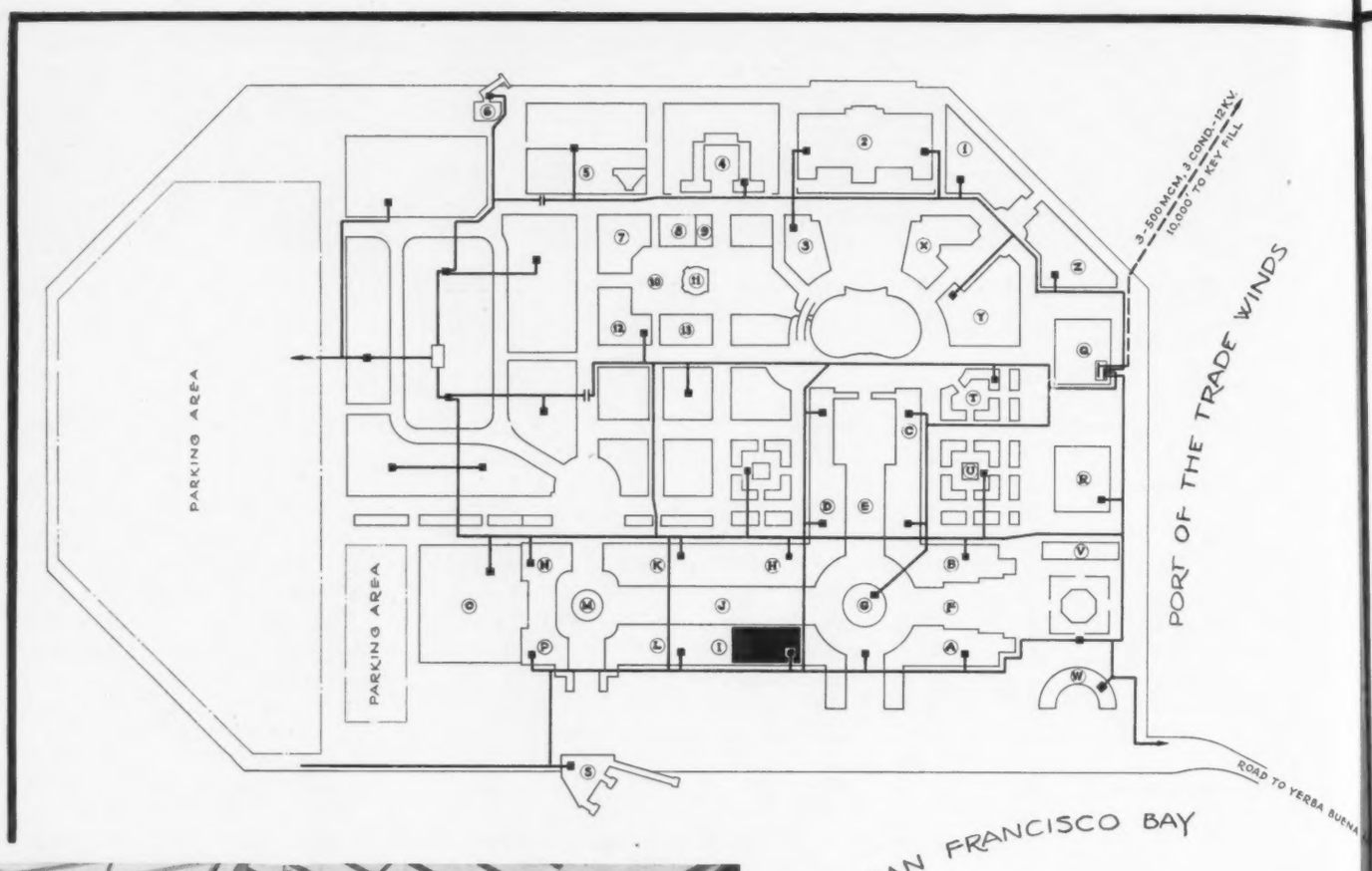
To many Americans these will be the discovery of the Pacific Ocean. Such names to many have only been exotic and mysterious parts of the earth ideal for the back drop of an adventure story. But the world has become cognizant of the Pacific Ocean in the past few years. Such exhibits at the San Francisco Fair will initiate those who visit them to the commercial as well as the cultural meaning of these countries.

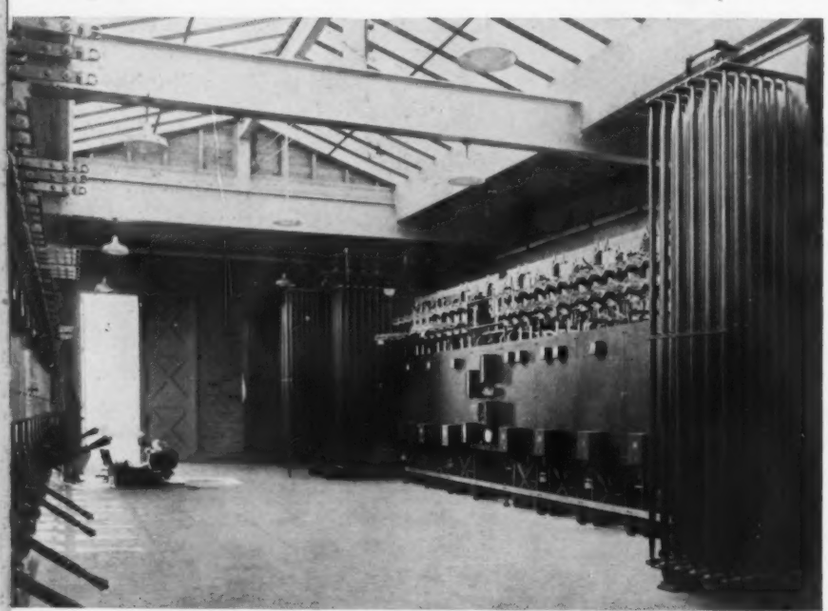
What this awakening will mean to the commerce and expansion of the West, and with it the electrical industry, cannot well be fully anticipated. Perhaps there is a discovery to be made in that respect even by the West as a result of this Fair.

Official guide books tell amply of the architectural motifs, the exhibits, the history, dedication, and romance of the Exposition. Succeeding pages of this guide tell and illustrate electrical detail not to be found in such guides. Anyone in the electrical industry who can visit the Fair personally may use both to advantage to find more easily and quickly the features of interest and value to him personally.

And with a realization of these four significant values of the Fair to the industry, he will double his own receptivity and his recompense from it.

POWER


PARKING AREA
PARKING AREA
3 - 500 MCM, 3 COND., 12 KV.
10,000' TO KEY FILL
PORT OF THE TRADE WINDS
ROAD TO YERBA BUENA
SAN FRANCISCO BAY



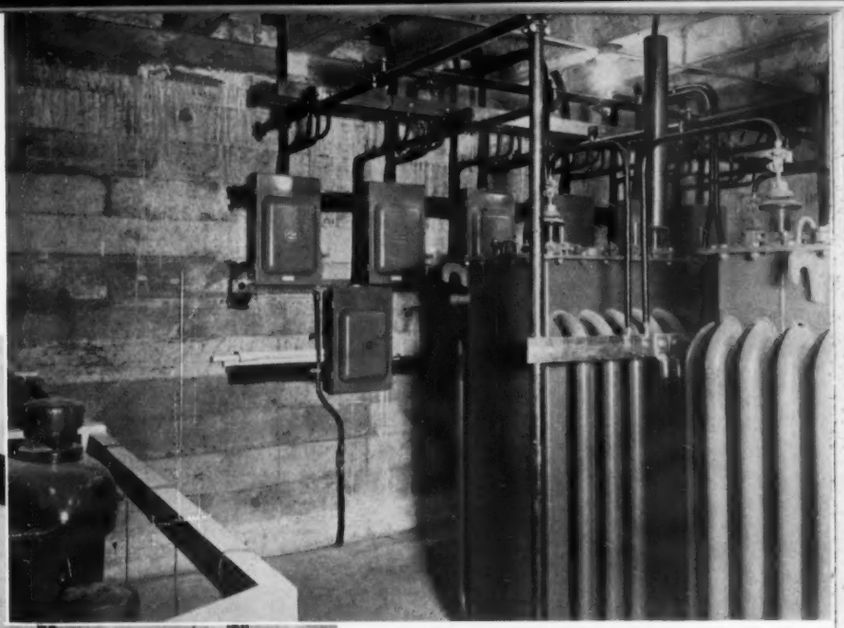
Main substation—at right, primary side, with 11 kv. disconnects and meters and the four 3-phase transformers. Substation capacity is 16,000 kva. Another outdoor sub of 4,000 kva. serves the Gayway. At left the secondary distribution board. Fifteen 4 kv. feeders branch from here.

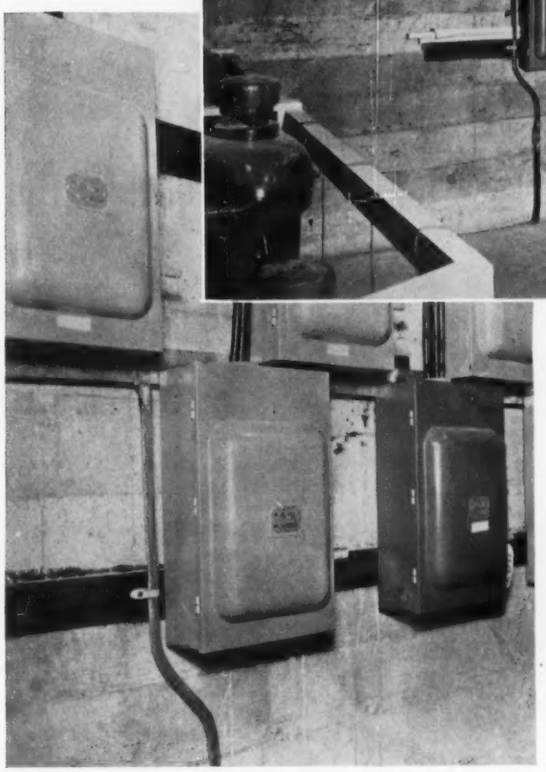
POWER for the Fair comes by 12 kv. submarine cable from the Pacific Gas & Electric Co. substation at the Key System fill, to a permanent substation in one corner of one of the permanent hangar buildings; for after the exposition, Treasure Island becomes a permanent airport. As shown in the map above secondary distribution feeds 40 or more transformer vaults, 12 of which have two banks of transformers for decorative and for exhibit lighting. Four vaults provide 480-volt, 3-phase power for fountain pumps and for large exhibits, such as Ford's. Taps from main feeders are staggered so that no two adjacent vaults are on the same feeder. Loss of a feeder would not leave any section dark. Exhibit feeders are run from the vaults 4-wire, 3-phase, 120/208, on cables suspended to the lower trusses of floor joists by a special clamp designed for the purpose. All interior wiring is in metal raceway.

SUPPLY

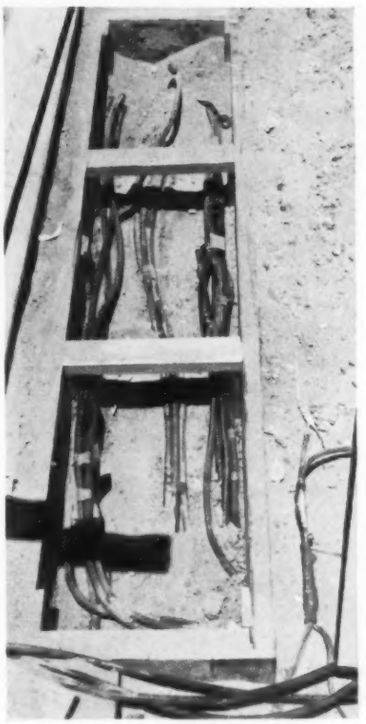
A Mines, Metals, Machinery
B Homes and Gardens
C Agricultural Hall
D Foods and Beverages
E Court of Reflections
F Court of the Moon
G Tower of the Sun
H Vacationland
I Electricity, Communication
J Court of the Seven Seas
K Transportation
L Hall of Science
M Court of Pacifica
N Ford Building
O Cavalcade of Golden West
P Unassigned
Q Fine and Liberal Arts
R Hall of Air Transport
S S. F. Ferry—Radio Station
T So. California Counties
U Model Homes, Horticulture
V Yerba Buena Women's Club
W Administration Building
X California Pavilion
Y S. F. and Bay Counties
Z Sacramento, Tahoe Co.

1 Shasta, Cascade, Redwood
2 U. S. Government
3 Calif. State Auditorium
4 Hall of Western States
5 Recreation Field, States
6 Oakland Ferry Pier
7 Philippines, Alaska
8 Australia, Hawaii
9 French Indio China
10 Pacific Basin Court
11 Pacific House
12 Latin America Group
13 Netherlands East Indies
Gayway, including Chinese Village between 6 and 0. Unnumbered area contains France, Italy, Argentine, Japan



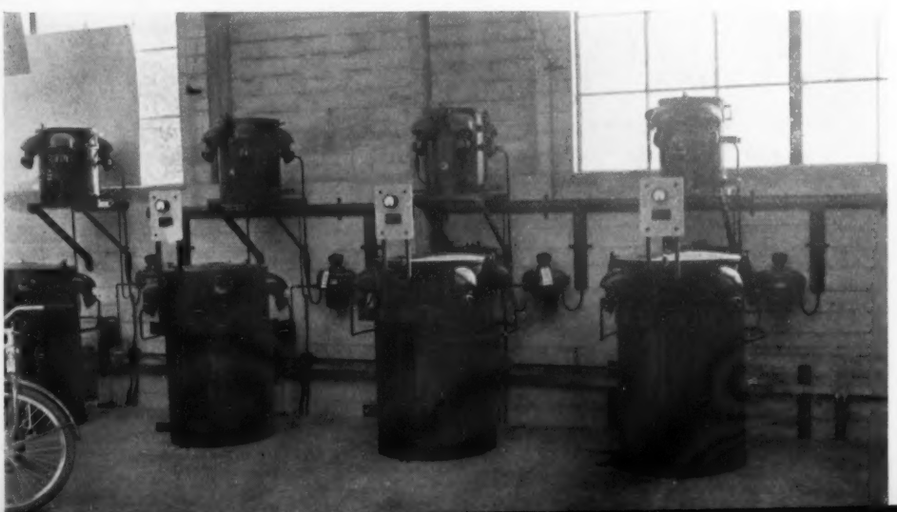


Above: Concrete transformer vault, with fused disconnects at left, separate transformer banks for decorative and for exhibitors' requirements, and distribution panel on the wall. Close-up shows how the neutral copper bus was used as a support, permitting savings in cost by use of straight 3-pole switches.



To simplify switching a radial rather than a loop distribution was used, at 4 kv. on 4/0, 40% rubber and braid conductors, 1250 kw. per feeder, in shallow trenches in the sand, covered with redwood planks. Where feeders crossed roads or were subject to injury they were run in duct. Above: One of the redwood plank splicing boxes, cover removed, where taps are made to a transformer vault. Neutral is run bare outside the box as seen above.

Street lighting is separated from the decorative lighting. It works off one side of a 4-kv. bank, in a series system, 2300 volts to ground. Four circuits, cascading at 4 locations, and two spare circuits, supply the street lighting from the main sub. One circuit of sodium-vapor lamps on the approach to Treasure Island from Yerba Buena Island and the bridge, is also fed from the main substation street lighting bank shown below.



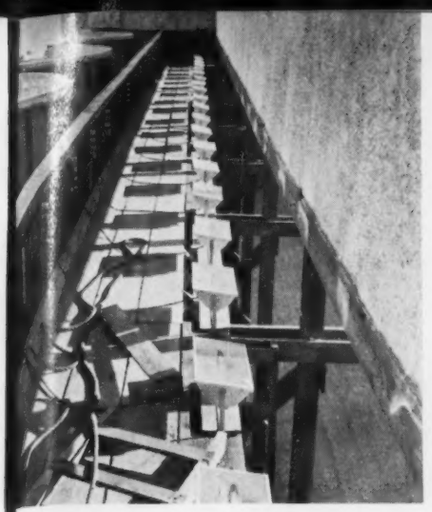
LIGHTING

Tower of the Sun and Elephant towers at the Portals of the Pacific — floodlighting by projectors, color screened.

NIGHT converts Treasure Island into a dream world of color and beauty. Unavailable at any previous exposition have been the new delicately tinted colors possible now with the fluorescent tubular lamps. Also new is the use of large panels of fluorescent paints, activated by "black light" mercury ultra-violet lamps. High intensity 400-watt mercury lamps to bring out blues and greens of trees and foliage are also new to expositions. Thus, with the floodlights and searchlights of former fairs, and even some touches where lamps are studded as in old time fairs, these new lighting sources bring a fresh and novel technique into use that may influence future decorative lighting materially.

Architecturally this exposition combines enough of both romantic and modern to please both camps. The main exhibit part of the fair is romantic in design, and here both color and beauty are lavished. In the state and federal government groups of buildings the severe modern design provides functional lighting, unconcealed and uncolored. Lighting here serves only the utilitarian purpose of revealing the form of the structures. Such contrast provides the illuminating engineer with an unique opportunity for study of both.

Exhibits, and buildings of the foreign governments and of several states, furnish still further opportunity to see lighting techniques of wide variety. Interesting will be the flexible and extensive use of the new reflector spot and flood lamps, fluorescent and lumiline lamps, and fluorescent tubing, control lenses and louvers, and silhouette effects. Plastics such as Lucite and Celloglass are in use extensively.



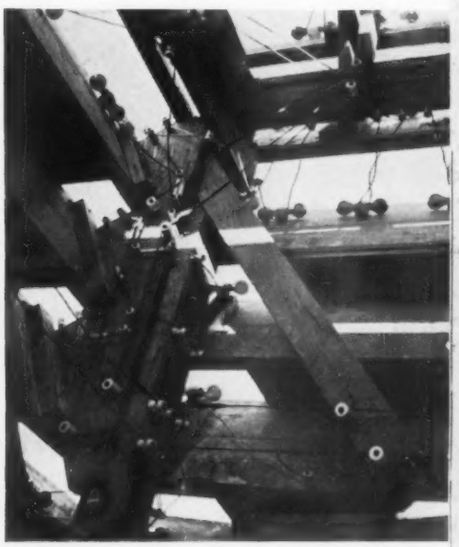
Over 2,300 fluorescent lighting units, blue, pink, green and gold, are concealed behind shrubbery, setbacks (as above) in niches and windows, for decorative lighting of inner courts. Where inaccessible, open wiring, 4-wire, 3-phase, on racks or railings feeds nearly all decorative lighting.

More than 8,000 Novalux handy floodlights of from 300- to 1500-watt sizes are used in decorative floodlighting. The outer wall is lighted in white from units such as above. Entrance to one of the transformer vaults is seen at the rear, right. Floodlights on walls are usually set against the retaining wall of a shallow trench behind shrubs, with wiring adjacent.

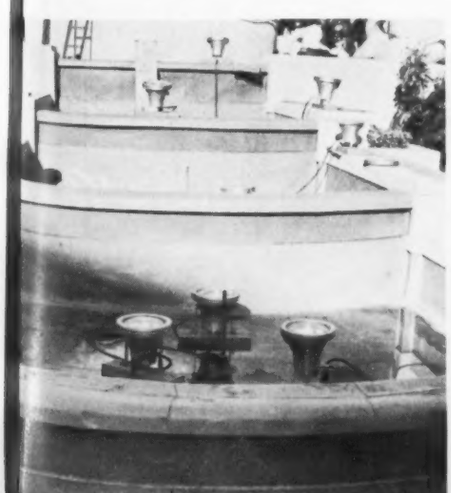
In the blue and purple Court of the Moon both blue color screened incandescent 1000-watt floods and blue fluorescent units are needed to cover great wall areas effectively, as shown above. Note aluminum trough reflector fluorescent units mounted on short separate planks for adjustment.

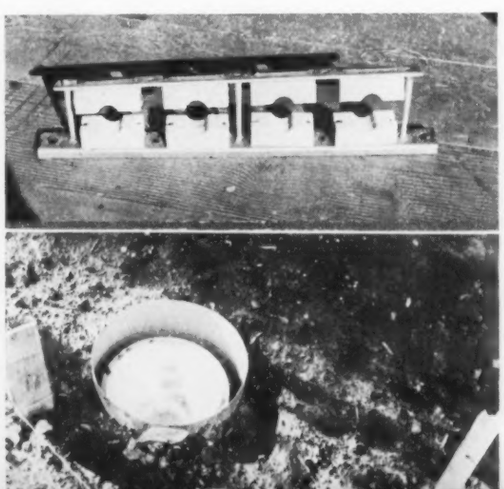
Below: underwater floodlights for fountains, mounted on small movable concrete blocks, fed by rubber cord, underwater. Adjustable, this temporary system will last throughout the fair. In the Pacifica fountain domes of Lucite transmit colored light from a light box underneath to the water.

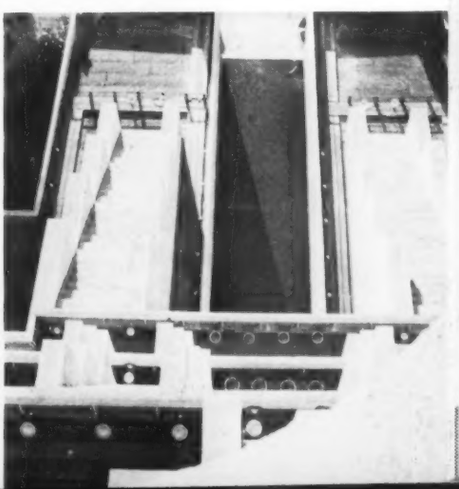
Above and at left, banks of projector floodlights. One eighth of the Tower of the Sun is covered by the bank of six 1500-watt clear searchlights and three each of amber and clear 1000-watt floodlights. Below, distribution cable support used under exhibit buildings; and one of many 400-watt mercury floods used under the trees, in a metal shield, in the ground.

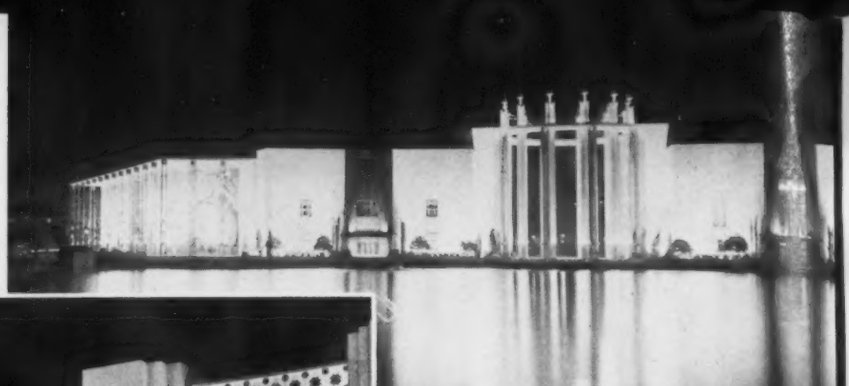


Elephant towers are lighted as shown above and below. Above: vanes of the Howdahs on the elephants are lighted by ruby natural color lamps. Below: the clear white and deep red-screened floodlights used on the stairways and fronts of the elephants themselves, no fluorescents being used.

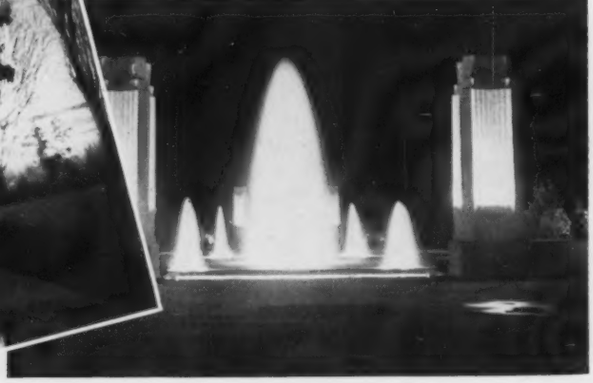








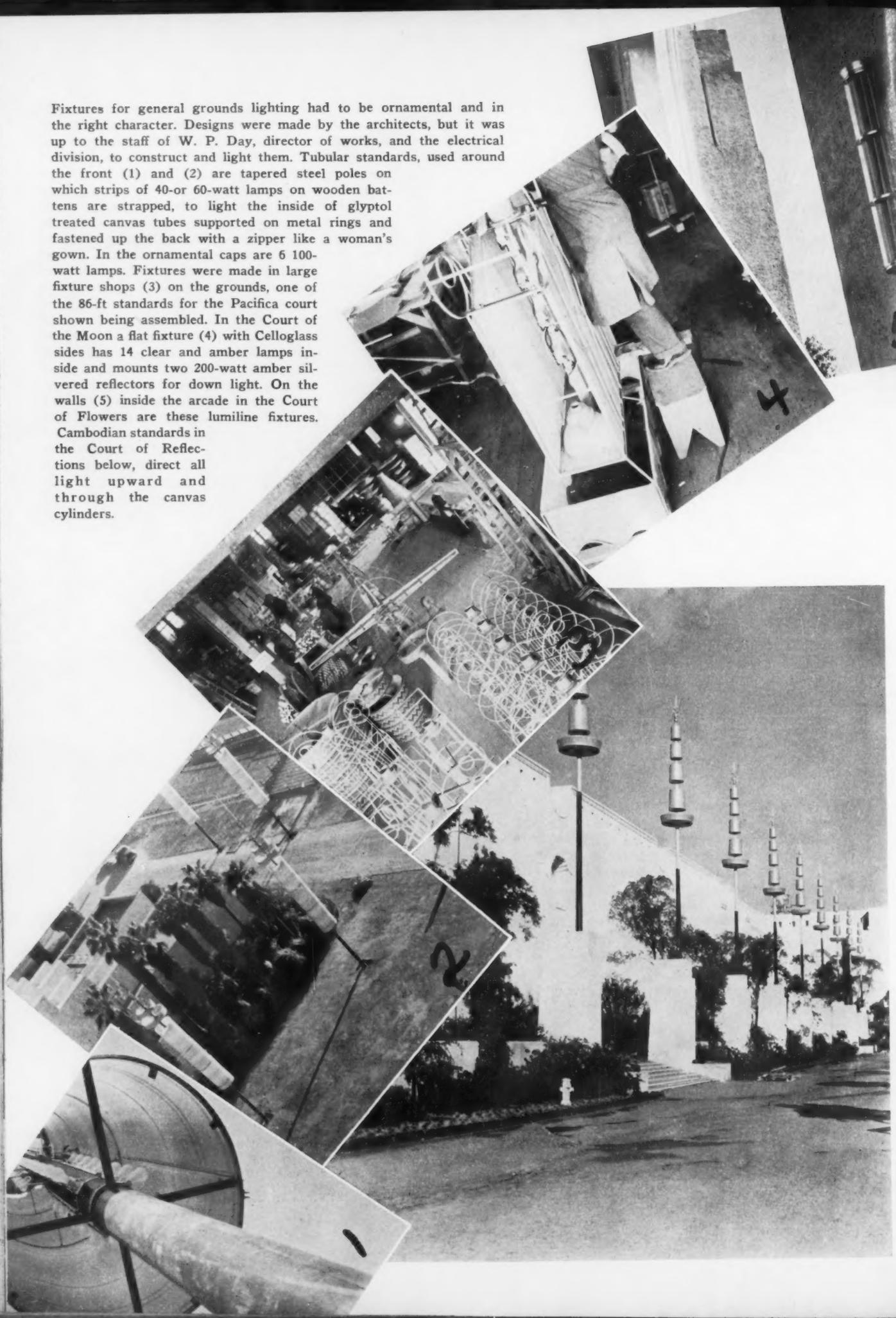
Facing the lagoon, the California Pavilion and the San Francisco building are of the modern school. Murals and wall surfaces are lighted by clear white floodlights, the color coming from the murals and building walls themselves. At left is the Court of Pacifica, 80-ft high goddess of the Fair. Behind her a steel, star-studded screen is silhouetted against a light box in which indirect light from concealed floods changes colors, controlled by Thyratron apparatus. In the fountain Lucite domes transmit hidden color from below into the water. Standards such as seen at extreme left, are like great masts, 86 ft. high with 300 40-watt lamps inside the glyptol treated canvas tubes, 5 ft. in diameter, to light them up. Below, left: the great arch dividing the Courts of Reflections and Flowers, floodlighted in clear white. Below, the fountain at Treasure Garden, at the south end of the grounds. Underwater floods light the sprays in white. Around the edge of the pool and in the pilons there are green natural-color lamps.

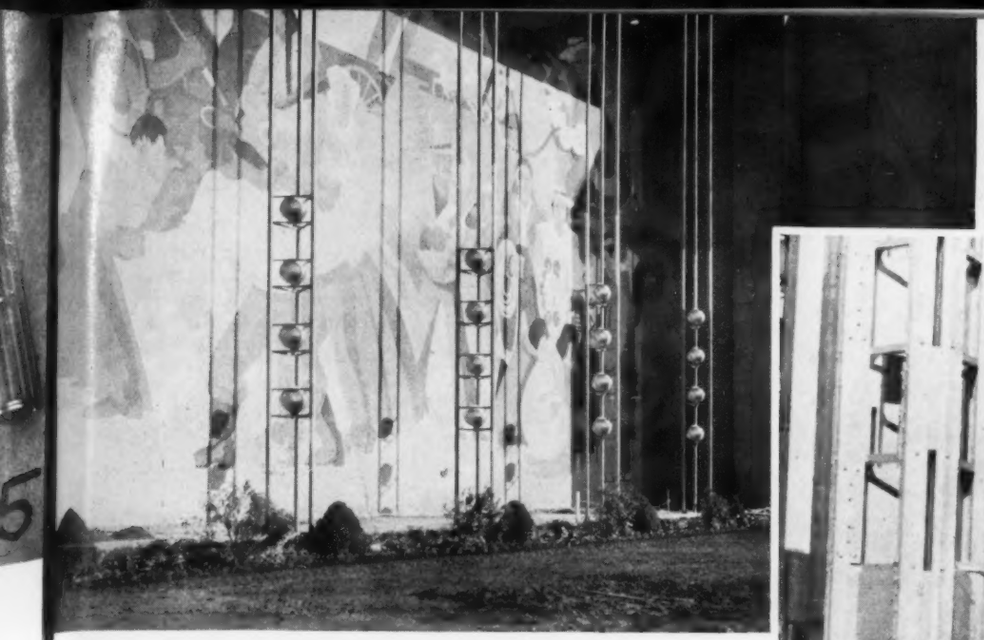


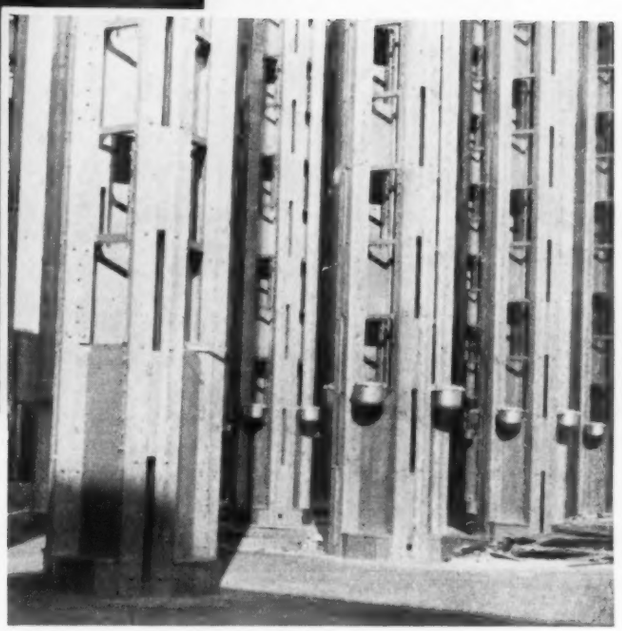
Still mirror pools in the Court of Reflections give it its name. The salmon pink walls floodlighted by fluorescent, Cambodian lighting standards in red, as well as the white and amber floodlighted Tower of the Sun, with traces of lavender and red in its arches are reflected in these pools. A single 15-watt blue fluorescent tube lights each niche. Looking toward the Court of Flowers the 60 ft. Arch of Triumph is reflected in these same mirrors. At right, below, in the Court of the Seven Seas, walls are floodlighted by green and gold fluorescent units. The lighting standards are fashioned like ship's masts. The crows nest conceals a spot directed on the ship figurehead opposite it, and has four 200-watt louvered, amber reflectors pointed downward to light the sails and walks. Coves in the base direct light up on the lower sail. On each side of the portals are relief murals of the famous clipper ship, Flying Cloud, behind which a green fluorescent lamp gives the illusion of distance. In this Court too are the niches containing bas-relief murals in fluorescent paint.

Below: Deep blues and purples with contrasting brilliant rose color in the grills and tower caps make the Court of the Moon the most spectacular lighting achievement. To get sufficient intensity of blue to cover the large wall areas both fluorescent blue units and 1,000-watt incandescent floodlights, with blue color screens are banked together. Red fluorescent tubes are used in color boxes behind the grills. Under the trees, in the ground are 400-watt mercury lighting units.

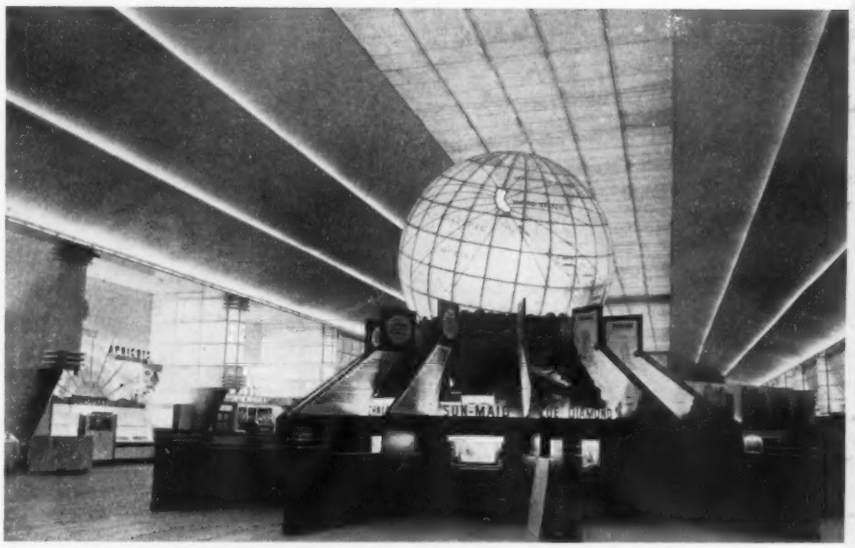
Fixtures for general grounds lighting had to be ornamental and in the right character. Designs were made by the architects, but it was up to the staff of W. P. Day, director of works, and the electrical division, to construct and light them. Tubular standards, used around the front (1) and (2) are tapered steel poles on which strips of 40-or 60-watt lamps on wooden battens are strapped, to light the inside of glyptol treated canvas tubes supported on metal rings and fastened up the back with a zipper like a woman's gown. In the ornamental caps are 6 100-watt lamps. Fixtures were made in large fixture shops (3) on the grounds, one of the 86-ft standards for the Pacifica court shown being assembled. In the Court of the Moon a flat fixture (4) with Celloglass sides has 14 clear and amber lamps inside and mounts two 200-watt amber silvered reflectors for down light. On the walls (5) inside the arcade in the Court of Flowers are these lumiline fixtures. Cambodian standards in the Court of Reflections below, direct all light upward and through the canvas cylinders.

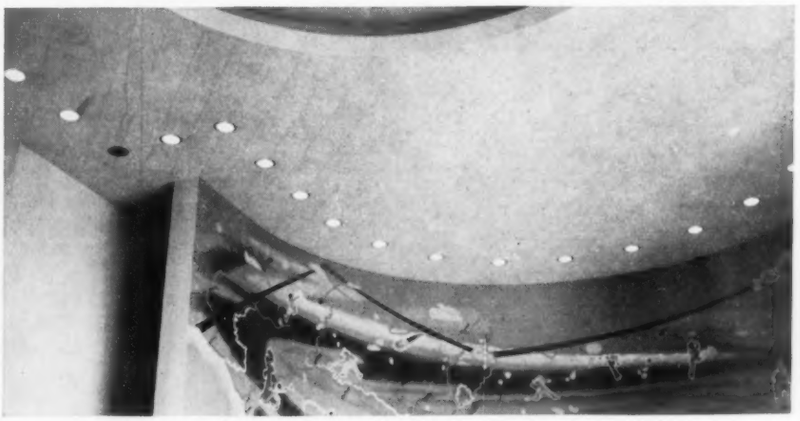




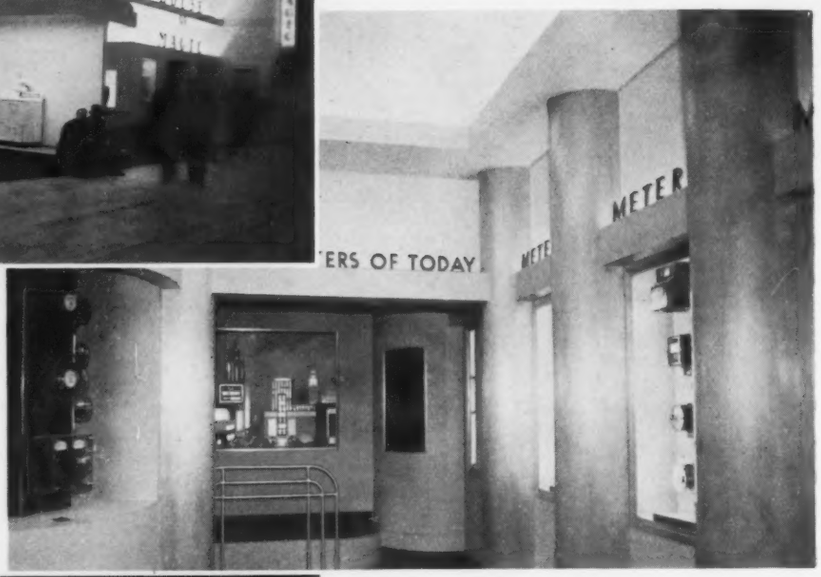


Modern and functional are the government group of buildings on the east side of the island. Lighting equipment is part of the functional design. Hence consulting electrical engineer G. M. Simonson and Alta Electric, on the Federal Building, put 750- and 1000-watt floodlamps in the round ball decorations to light the murals, (above) and 1500-watt searchlights shooting straight up the 48 columns as shown at right. Directly below, how Engineer Frank Clayton of the California Commission placed floodlights for murals on California buildings. At right the lighting in the Agriculture building installed by C. A. Langlais. Celloglass ceiling over which is 37.5 kw. of light; a neon blue cove, and a cove of 25-watt incandescents on 12-in. centers. Celloglass buttresses along side walls each have 1500 watts of light behind them. Below, right, the California Pavilion ceiling, with 500-watt shallow reflectors covered with fresnel lens. These spread the light to side walls for the murals and down to the floor for dancing, etc. The Federal Building and the California auditorium both have theaters equipped with Ward Leonard Hysterset transformer type dimming, similar to that at Stanford University. A puppet show and a national defense diorama in the Federal Building are similarly equipped.





General Electric occupies a large corner of the Palace of Electricity with its 1939 "House of Magic" show, kitchen modernization that speaks for itself, spectacular glass enclosed color changing fountain-Thyratron controlled, Science of Seeing lighting show, displays of kitchen appliances and other equipment, and the official exposition short-wave radio broadcast station W6-XBE, of 20 kw. capacity.



Sangamo has a compact display of meters and relays in the Palace of Electricity. In the background a model city goes through a 24-hr. cycle, with lights and signs flashing at night. In fluorescent lighted wall panels are various types of meters and time controls. In another niche a revolving stand displays still more meters.

Okonite seems to have one corner of its booth held up with a section of exceedingly large armoured submarine cable. Inside are lighted cases in which the wire and cable products of this company are displayed. On the walls are photo-murals of outstanding installations in which Okonite has been utilized in installation.

Frigidaire occupies a third of the center section of the General Motors exhibit in the Vacationland building. With dramatic advertising backgrounds and trained attendants visitors are given a thorough demonstration of Frigidaire ranges, refrigerators and commercial equipment. The entire exhibit makes spectacular use of lighting, the most outstanding of which are the gold fluorescent strips on two towers.

EXHIBITS

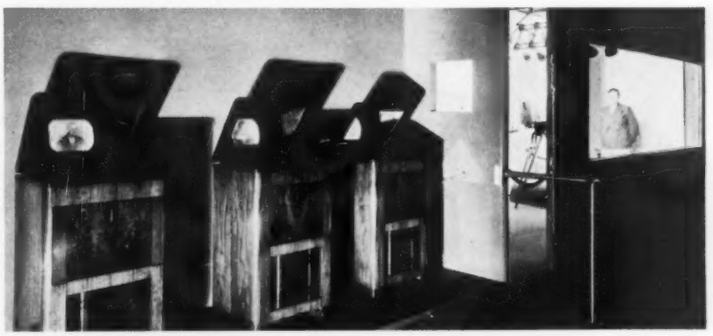
MANUFACTURERS of equipment used in generation, transmission, distribution, and utilization of electricity are not all to be found in the well filled Palace of Electricity and Communication, located just north of the Elephant Towers that flank each side of the Portals of the Pacific. Often they are to be found in connection with other industries—motors, steel, foods, transportation. Some of the latter are illustrated in the following pages.

Pacific Gas and Electric Co. represents the power industry ably with its giant diorama, extending across the entire south end of the Palace of Electricity. With its educational displays below, a lounge and an auditorium, the upper space is divided into three sections. The center is a brilliant scene, in three dimensions, depicting the city of the future. At the left, with life-sized figures, in motion, are pioneers with an ox cart crossing the Sierra to California. At the right is old San Francisco of gold rush days.

In the same palace are the large exhibits of General Electric Co., Westinghouse, RCA, American Telephone and Telegraph, International Business Machine, Singer Machine Co. and the displays of Pacific Electric Manufacturing Co., Sangamo, General Cables, Okonite, American Time Signal, and a cooperative appliance display including Hotpoint, Norge, Thor, Thermador, etc.

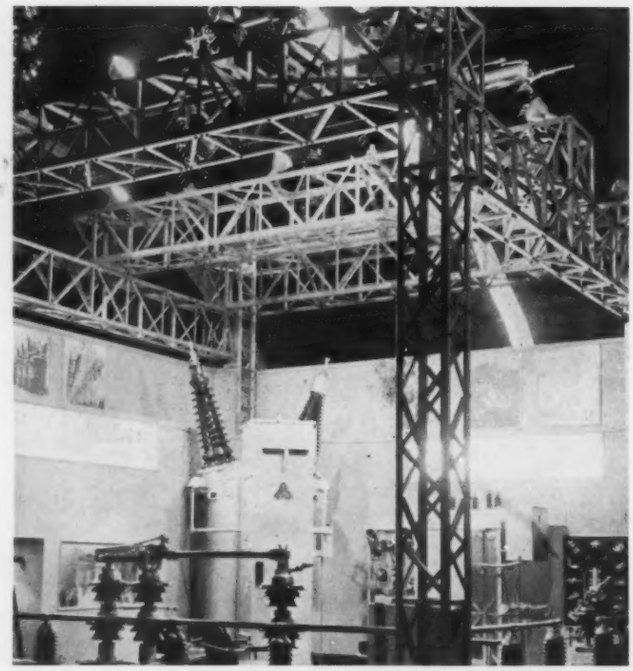
General lighting in the exhibit palaces, except in the Palace of Electricity and the California Agriculture palace, is simple—high bay aluminum reflectors with 750, 1000 and 1500 watt lamps mounted on an adjustable arm along the roof truss chords, producing 10 ft. candles on the floor. In the Electricity palace, P. G. & E. designed a continuous lighting trough with 100-watt lamps on 1-ft. centers, shielded, placed along 1650 ft. of roof chords.

Westinghouse entertains large crowds who come to watch its robot perform and remain to see apparatus, industrial equipment or electric kitchen and laundry appliances. Either pictures or actual equipment representing its entire scope are shown here.

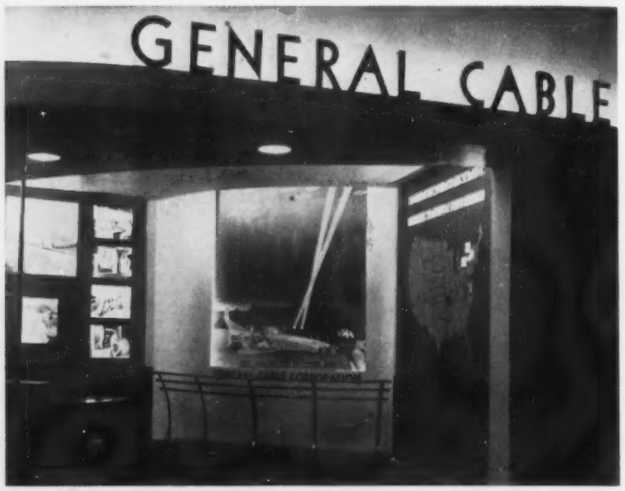


RCA has several spectacular devices, among which are a television studio and receivers, facsimile newspaper equipment, radio marine apparatus, beam instruments for navigation—and a handsome lounge where tired visitors may relax and listen to radio.

Columbia Steel, a division of Bethlehem, is found in the Transportation building. Golden Gate Bridge tower replica marks the exhibit. Illuminated murals and pictures display the field of this company's activities—including steel transmission towers.



Left: Pacific Electric Manufacturing Co., with switch structure framework of a substation, exhibits its high voltage equipment. It even provides a ladder by which to reach the upper structure and examine the opening and closing of its air break switches, breakers, and service restorers. A tubular bus rail encloses a lounge and apparatus displayed on the floor.

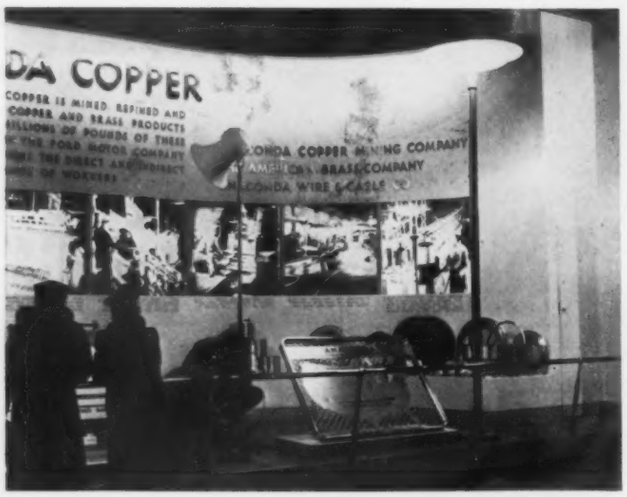


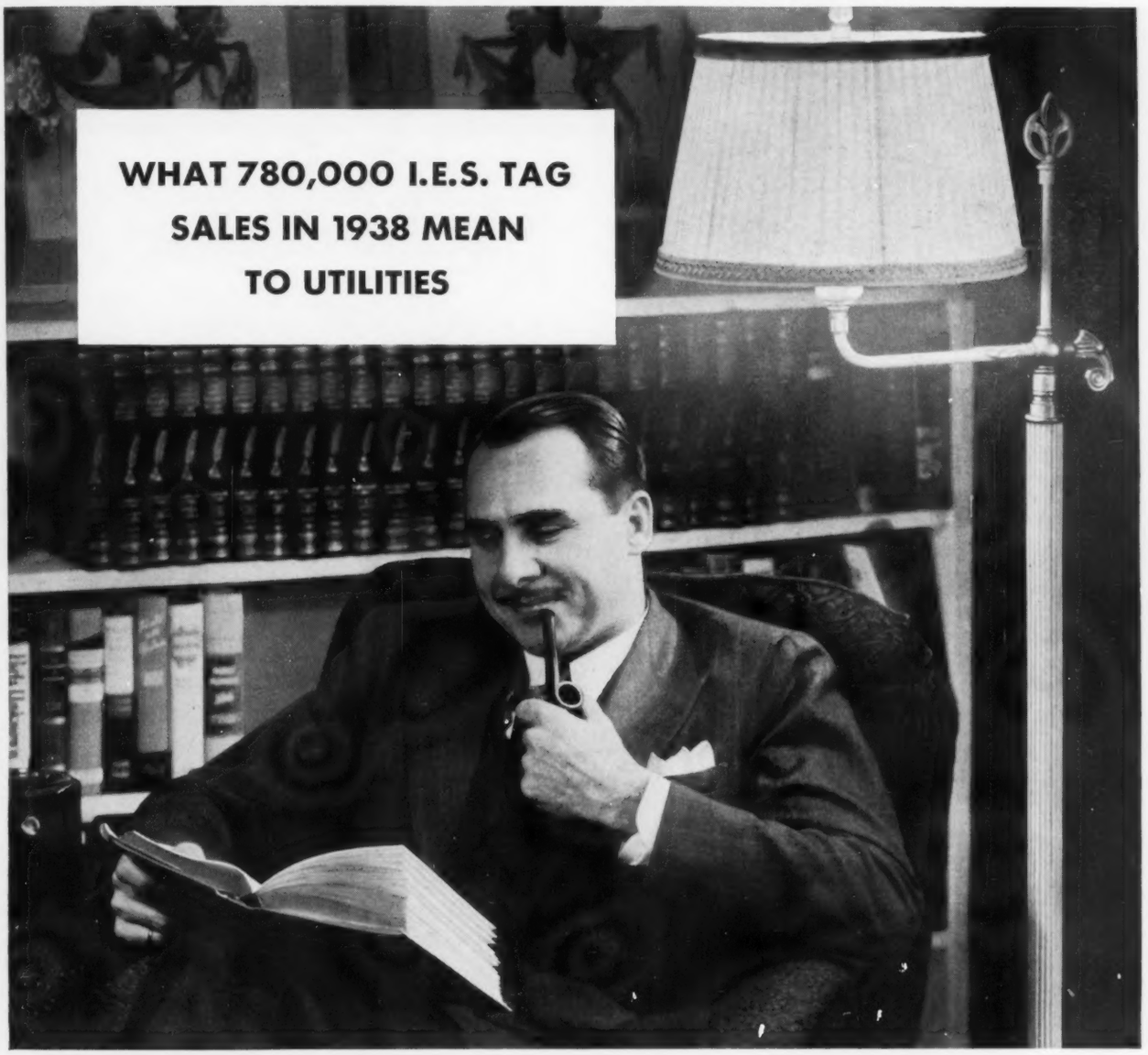
Above: General Cable Co. occupies a corner space in the Electricity Palace where lighted pictures illustrate notable installations.

Hotpoint, in addition to a kitchen in the cooperative display, has this all-electric kitchen in the cooperative dried California fruit exhibit. Even the gas industry turns to an electric dishwasher of this make for its "all gas kitchen." The cooperative electric appliance exhibit is in the Electricity and Communication Bldg.

Below: U. S. Steel is found in the Mines and Machinery Bldg. Its lighting alone is worth any electrical man's visit. Coves, in-built control lens, and fluorescent tube are seen here on the back of the exhibit.

Anaconda is to be found as an actively demonstrated part of the Ford exhibit. A lecturer describes copper from mine to wire and strip mill, tells of its use in wiring a car as well as a home or factory. At the right, U. S. Steel's extensive exhibit uses dioramas to show a city of the future, shows steel manufacture in miniature, demonstrates and makes tests.





WHAT 780,000 I.E.S. TAG SALES IN 1938 MEAN TO UTILITIES

APPROXIMATELY 780,000 I.E.S. Certification tags were sold last year. In the last quarter alone, the sales of these tags in 1938 showed an increase over 1937 of more than 74 per cent.

Of course, these tags in themselves are an indication of added load for lighting companies. But that's only a start. The first part of this year will witness the most powerful spring advertising campaign ever launched in I.E.S. history.

Millions of people—thousands of them your customers—will see General Electric advertising featuring I.E.S. Better Sight Lamps in these magazines: *Saturday Evening Post, Colliers, Liberty, Ladies' Home Journal, Women's Home Companion, McCalls, American Magazine, Cosmopolitan, Redbook, Good Housekeeping, Parents', and Child Life.*

Lighting directors and home lighting supervisors now have more effective reasons than ever to urge department stores and other portable lamp outlets to stock the new I.E.S. Better Sight Lamps . . . in table, floor, and wall models.

Each I.E.S. Better Sight Lamp installed is an added load builder for the utility. For further information, write to General Electric Company Dept. EW-C Nela Park, Cleveland, Ohio.

FOR THREE-LIGHT LAMPS - MAZDA THREE-LITE BULBS

100 - 200 - 300 WATT
now only . . . **60c**

50 - 100 - 150 WATT
now only . . . **45c**

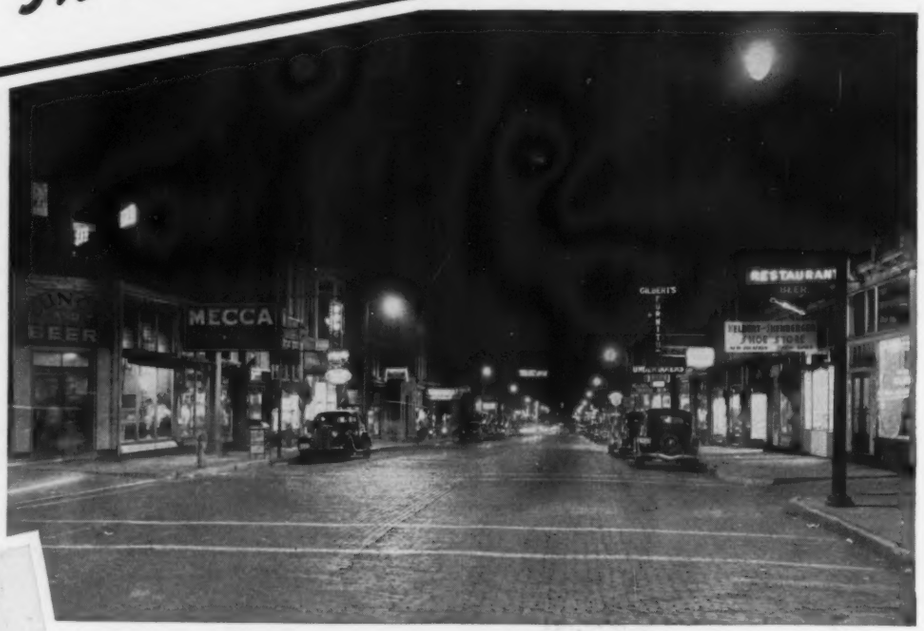
THEY STAY BRIGHTER LONGER

GENERAL ELECTRIC MAZDA LAMPS

General Electric does not make I.E.S. Better Sight Lamps but publishes this in the interest of better sight.

TRAFFIC SAFETY LIGHTING SAVES LIVES

In Ashland, Ohio



ASHLAND, OHIO, (Population 11,401) has adopted Westinghouse TRAFFIC SAFETY LIGHTING to reduce nighttime traffic deaths. Thirty-nine Reflectolux Sr. luminaires were installed by the Ohio Public Service Company on main thoroughfares. Twelve Reflectolux Sr. units with Sodium Vapor lamps illuminate dangerous intersections.

Westinghouse Reflectolux Sr.—Designed for Incandescent, Combination Mercury-Incandescent and Sodium lamps.

Streetlighting was primarily and originally a safety measure. But because illuminating engineers applied the science of seeing to the visual needs of the automobile driver, streetlighting systems are now reaching their fullest safety value.

As speed and heavier nighttime traffic have increased the need for TRAFFIC SAFETY LIGHTING, Westinghouse has kept pace with the perfection of new lighting equipment and product improvements. Westinghouse makes available luminaires, accessories and control equipment for every street and highway illuminating need. Carefully prepared engineering specifications and rigidly controlled tests at the factory and on the job assure absolute satisfaction.

For complete details on the Reflectolux line of luminaires and the Sodium Highway Luminaire, call your local Westinghouse Lighting Specialist, or address Westinghouse Electric & Mfg. Co., Lighting Division, Edgewater Park, Cleveland, Ohio.

Westinghouse Lighting Equipment

KFBK
SACRAMENTO
1490 KILOCYCLES

THE RADIO BEE

KMJ
FRESNO
580 KILOCYCLES

Vol. I—No. 16

February 17, 1939

Conference At Last Minute Results In Shasta Peace Pact

Redding-(UP)-A last minute peace conference resulted in a midnight announcement that work would be halted on a railroad relocation in connection with [illegible] Dam where [illegible] Secretary of the Interior Harold L. Ickes Thursday

Governor Asks Contract For State To Operate Central Valley Project

San Francisco-(UP)-Governor Culbert Olson recommended to

Pictures on the Air

ON the morning of February 2, in 100 California homes, subscribers to the *Radio Bee* climbed out of bed, went to their radios, and tore off an eight foot strip of thin white paper, blackened with type and pictures—it was their morning newspaper.

Thus facsimile broadcasting began in the West, using standard broadcast bands to transmit signals and using the interconnected facilities of Pacific Gas and Electric Co. to synchronize senders and receivers. The idea is not brand new, but this is the first time a regular service of comparable size has been made available to homes, and the first time that network broadcasting has been employed.

Under a Federal Communications Commission order permitting radio stations 50 facsimile receivers each, the McClatchy Newspapers began the service, writing and composing the paper in the Sacramento Bee building and broadcasting it there over their station KFBK and also via wire over their station KMJ in Fresno.

Facsimile signals are produced by a mechanical-photo-electric scanning equipment, output of which is suitable for modulating a standard broadcast transmitter. Receivers, likewise, are simple. Upon reception, the signal is amplified to actuate a printer bar magnetically.

Fig. 2 indicates the principle of reproduction. A strip of paper and a strip of carbon paper are held between the printer bar and a rotating helix. As the helix rotates (at 75 r.p.m.), the point of intersection of helix and bar moves in a straight line across the width of the paper strip. When a signal causes the bar to move, a black dot is printed at the point of intersection. Upon completion of a line, the paper has moved forward 1/125 in., another line is printed and so on.

Synchronization is achieved by means of synchronous motors operating on an interconnected a.c. system. Within a line, correlation of the position of the printed point with the point being scanned at the sending station is achieved by an operation called "automatic framing." This consists of a signal from the sending station sent before each line is printed (i.e., once for each revolution of the helix). If, at this

Fig. 1 (top of page)—This reproduction of a facsimile print (actual size) closely resembles the original in quality and definition. Fig. 2 (below)—Principle of printing

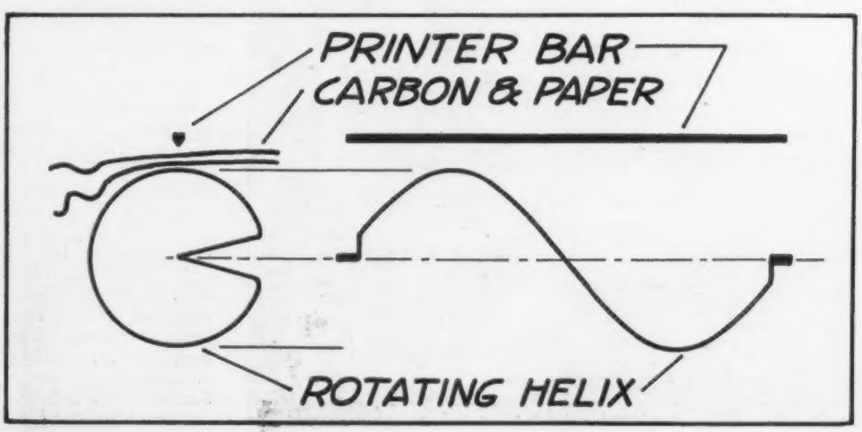


Fig. 3—Like Fig. 1, this actual-size print shows how much detail is retained

ENGINEERING

instant, the receiving mechanism is not in correct position, the synchronous motor is caused to slip. This procedure is repeated until the "framing" is correct.

McClatchy is broadcasting an eight-page paper, complete with comic strips and stock-market news. A page measures 8½ x 11 in. and takes about 20 min. to print.

The receivers are time controlled and are turned on in the early hours of the morning. At first, there is a 5-min. warm-up period, during which the automatic framing takes place — two or three minutes being thrown in for good measure. Then broadcasting begins, and within 3 hrs., before the household is awake, the paper is completed.

Paper is loaded much like roll film in a camera. The white paper roll carries 345 ft., the carbon roll 95 ft. These are corresponding amounts because the two move at different speeds. They represent a six-week supply.

Economics

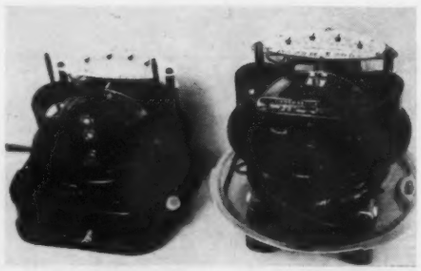
Reported investment in the transmitter and 100 receivers is between $30,000 and $50,000. Subscribers, at present, pay no fees, and the sets are not for public sale.

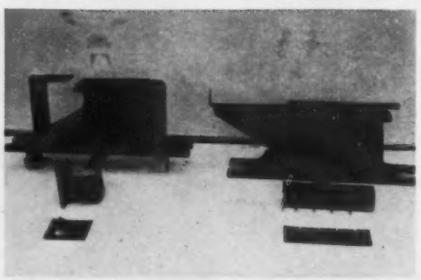
Simplicity and low cost are possible because the equipments operate but a few hours a day and can thus be serviced when not in use. For the same reason, duplicate equipments are not considered essential to reliable transmission. A guess as to cost of receivers places the present price near $250. This may drop as much as 50%, if and when mass production becomes the rule.

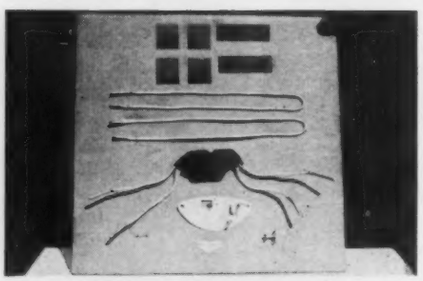
The equipment operating in California is that of the C. J. Young system, announced by RCA about a year ago. It is being demonstrated at the San Francisco World Fair.

What facsimile broadcasting portends is anybody's guess. The McClatchy operations are arousing keen interest in California. They are being supervised by G. C. Hamilton, general manager, with Howard Lane, chief of operations and Norman D. Webster, chief engineer. Intermittent broadcasts on a smaller scale have been carried on experimentally from various stations in the East.

The questions are: How will the public like it? What might it mean to advertisers? What threat is it to newspapers? In regard to the last, more than 4,000 words in 10-pt. type (this is 10 pt.) can be transmitted in an hour. The answers to those questions —not yet articulated by advertisers, radio men or the press—contain the secret of what facsimile broadcasting may eventually become.







(Top to bottom) Fig. 1—(left) 5-amp., 115-volt, 2-wire meter, old type; (right) same rebuilt to 25-amp., 230-volt, 3-wire. Fig. 2—Dies for stamping new coil-winding insulation. Fig. 3—Parts for converting: insulation; No. 8 stranded, double-cotton-covered wire for windings, completed winding, register parts; winding procedure

National AIEE Meeting On the Pacific Coast

Combining an exceptionally sound and well-balanced technical program with all the recreational attractions, electrical and otherwise, offered by San Francisco during the World's Fair, the combined Summer and Pacific Coast Convention, AIEE, promises to attract a record-breaking attendance.

So that every engineer will find his trip complete, either as a vacation or a working venture, S. J. Lisberger, convention chairman, and his committee have been at work since early last year.

Convention headquarters: Fairmont Hotel; the date June 26-30.

Simple Equipment Helps In Rebuilding Meters

By remodeling an old foot-operated punch press to stamp out various pieces of insulation, Northwestern Electric Co. has been able economically to convert 5-amp., 120-volt, 2-wire, I-14 meters to 10-amp., 2-wire and other capacities.

When the conversion is to 2-wire, 10-amp., the change consists only of providing new insulation, winding new coils, and placing a worm shaft in the register with a double-pitch worm to provide proper ratio. The procedure is illustrated at left.

MANY WESTERNERS were among those who gathered in New York City for the winter convention, AIEE. Here is a group examining a high-voltage high-speed circuit interrupting device which was described for the first time at the national meeting. Used in multiple groups, these are reported to have interrupted up to 2,250,000 kva. at 220 kv. on a 50-cycle system in times averaging 2.6 cycles. From left to right are J. B. MacNeill of Westinghouse and G. E. Decker, master mechanic, and H.W. Tice, assistant manager of operation, both of Southern Calif. Edison —*Westinghouse Photo*

Capacitors Transferred As Peak Loads Shift

By H. H. Buell

IN spite of the fact that the use of capacitors on distribution lines is, relatively speaking, a recent practice, their value in correcting power factor, reducing losses, and thereby increasing the capacity of the lines has been well demonstrated. It is not the purpose of this brief article to outline the theory underlying the use of capacitors, nor to develop or apply the mathematics connected with their use. Such details are well covered in technical literature and have long been thoroughly understood. This article does, however, describe an unusual application.

Capacitors installed on any one distribution line represent a considerable investment, especially if the installation is such as to secure the greater practical benefit on a line which normally operates at very low power factor. On the other hand, it is very apparent that, within limits and under certain conditions, a very large investment in additional lines and associated substation equipment would be required to secure the same benefits brought about by a considerably smaller investment in capacitors installed on an existing line. It is always a goal, however, to make the greatest possible use of any equipment which is installed, either in substations or out on the lines, and if one piece of equipment can be made to serve two purposes, and thereby operate at a much higher annual load factor, savings in investment can be realized.

In the case under consideration, a distribution line operating at 4 kv. serves considerable industrial load as well as a relatively small amount of residential lighting. The line is about 2 mi. long, measured from the substation to the center of load, consists of No. 4/0 copper cable, and feeds a section of the city which is difficult of access by any route other than that traversed by the existing line. Another 4-kv. circuit would, therefore, follow the same route, a condition which would be undesirable for several reasons, and which would lead to high construction costs. During peak season, load on the circuit exceeded 325 amp. with a voltage drop of about 16%, well beyond the capacity of the regulators on the circuit.

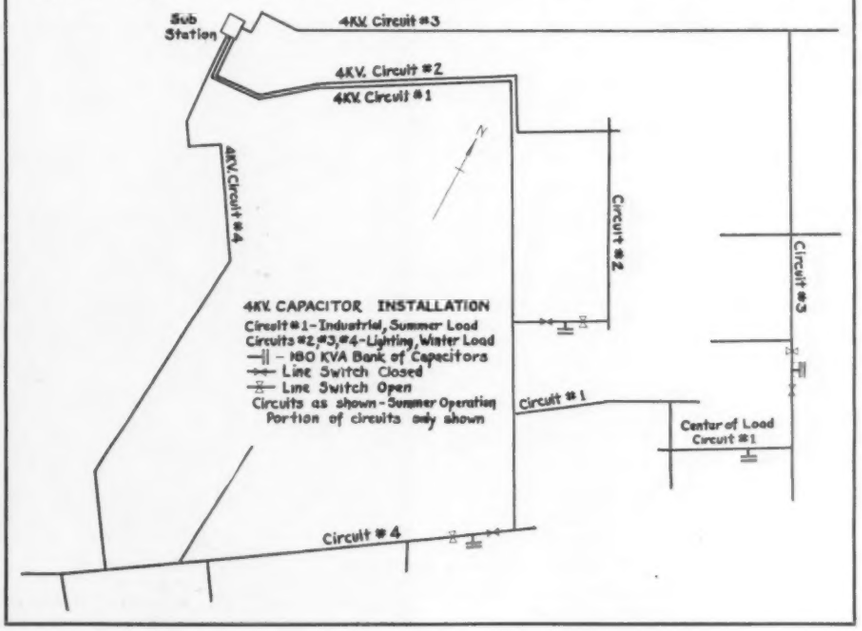
Fig. 1 (right)—Capacitor bank and two associated line switches as installed in San Jose. Fig. 2 (bottom of page)—Single line diagram of the feeders involved, showing location of the 4-kv. capacitor installations together with the switching facilities which are used to shuttle the units

Power factor of the circuit was abnormally low during peak season, being about 56%. This was due to the large connected load in small motors, underloaded for the most part, as will generally be found typical of the large non-engineered industrial plant.

All of these factors, taken together, indicated the use of capacitors to give permanent relief, at least for some years to come, or until there is substantial load increase in the area served. Accordingly, 720 kva. of capacitors were installed in four banks of 180 kva. each. As was to be expected, results found after installation agreed closely with computed figures, the line current was lowered to well below the safe capacity of the regulators, and the regulation of the line was brought within the regulator limits. Before and after characteristics of the line, at the time readings

Table I—Line Characteristics

Conditions	Station Volts	Load Center Volts	Voltage Drop-%	Circuit Amperes	P.F.-%
No capacitors on line.....	136.5	119.5	12½	280	57.5
720 kva. of capacitors on line....	128	119	7	178	93



were taken (which was not during peak season) are given in Table I.

The load on this particular circuit is almost entirely seasonal in character, consisting of fruit packing plants, canneries, a can manufacturing plant, etc., and has a relatively high load factor during the six summer months which constitute the fruit season. During the remaining six months of the year, however, load on the circuit is practically zero, as the connected residential lighting load is very small. On the other hand, the adjacent 4-kv. circuits in this same general area supply lighting load almost entirely and have their peak during winter months, at the same time as the system winter peak. These adjacent circuits are also loaded almost to capacity during their peak period, and relief will be indicated in the near future.

In view of these facts, it appeared desirable, under the conditions existing in these particular areas, to consider ways and means for utilizing the capacitors 100% of the time, thus realizing full benefit of the investment. Accordingly, the capacitors were so located and installed that, by merely operating two switches, one of which would normally be provided as a tie switch between two circuits, any one of three of the banks of capacitors could be transferred from one circuit to another and back again at the proper time of year. That is, the capacitors would be connected to the industrial circuit during the summer peak on that circuit and to the lighting circuits when the load on the industrial circuit had dropped to minimum.

Results thus secured have been entirely satisfactory, although, as was to be expected, power factor on the lighting circuits was considerably higher than that on the industrial circuit. Hence, much less capacity was required to secure the most practical results. The one bank of 180 kva. of capacitors, transferred to each of three lighting circuits, provides about the maximum desirable correction.

The single-line diagram (Fig. 1) indicates the circuit and switch arrangement on the four 4-kv. circuits in the area under consideration, while Fig. 2 shows a typical capacitor bank with the two associated line switches. Only main feeds appear on the diagram.

It is realized that the scheme employed meets a special case, and that the conditions might not be duplicated elsewhere. It is further appreciated that switching the capacitors from one circuit to another involves an operating detail which might not be carried out. However, there appear to be possibilities in this plan which might find application elsewhere.

Not Plotted

IN January, ELECTRICAL WEST predicted that when trains started running across the Bay Bridge thousands of ex-officio consulting engineers would pop out of the bush. This turned out to be a fact. On the first two days, some trains were a few minutes late, for it was a big task for railroadmen suddenly, just overnight, to combine two systems over a complicated new route and have everything run smoothly. They did their job well, but the 48 hours gave the ex-officios plenty to gripe about.

One woman passenger was heard to explain the situation as follows: "Well, my dear, you know the reason this thing is a mess—they pinched pennies everywhere. Everything about it is just the cheapest money can buy."

But there were even more charmingly naive explanations. This one, we think, is tops. It has the extra merit of being very scientific: "The big red Interurban trains eat up all the electricity. There isn't enough left over for the Key System trains. That makes the Key System trains run slow. Then the Interurban trains have to run slow to wait for the Key System."

Funny thing. None of them seemed to think the quick solution of the problem remarkable. With all trains running on schedule, the Monday-morning experts retired to oblivion—accepting the new as a matter of course.

Relative to nothing: The National Industrial Conference Board says that the annual federal tax on playing cards—$4,500,000—would have supported the government in the first few years of George Washington's administration.

Treasure Island—The Palace of Electricity catered to crowds throughout World's Fair opening week. P. G. & E.'s giant diorama had them standing five deep in a 200-ft. arc, watching the animated figures. G. E.'s house of magic and the Westinghouse exhibit were packing them in.

Pacific Electric Mfg. has a high-voltage switch structure which looks pretty imposing. Top honors for smooth handling of the public to Pac. Tel. & Tel. Electrical engineers, like the public, will get a real kick out of Bell's Voder (talking organ).

Both RCA and Westinghouse have standard television receivers working . . . public reaction: 10% are in awe, the rest say, "Oh there's television," with about as much spark as they'd say, "Oh, there's an airplane," or, "Oh, there's a potato." Oddity: the gas palace, or whatever it is, is illuminated with tiny electric lights made to look like gas jets . . . and Hotpoint chuckles over this one: the gas kitchen couldn't sidestep an electric dishwasher.

Transients Studied

By repeating any pre-set complicated transient condition on a 3-phase transmission line so a photographic record can be made, this commutator switching device, used with an a. c. calculating board, is of great assistance in the study of transient voltages. Westinghouse engineers report that observation of arcing grounds on a typical system showed that the highest transient voltages are produced on an ungrounded system. Strangely, however, for some values of neutral reactance, intermediate between the solidly grounded system and the Petersen-coil system, voltages are almost as large as on the ungrounded system

Hiya, Shakespeare

By Wayne Snowden

ENGINEERS, as a whole, should be among the finest writers in the world. Certainly so when sticking to their subject. For the average engineer there are but two prerequisites to writing: ability to think clearly, knowledge of the subject. Engineers have both.

So if you're one of the engineers who is going to write a paper—and you will be sooner or later—spend 15 minutes here on fundamentals. It may save you painful hours and your readers many more.

To begin with, why write at all? The purpose, of course, is clear: to communicate your thinking and experience to someone else. But for you yourself there are distinct rewards: recognition; the possibility of causing someone to comment on your work, thereby solving, perhaps, the very problem that had you stymied; your own satisfaction in contributing, however slightly, to the growth of knowledge.

You will, however, reap a strictly personal reward whether anyone reads what you have to say or not. Francis Bacon put it this way: "Reading maketh a full man, conference a ready man, and writing an exact man." Writing crystalizes thought. You may be surprised at how hazy your thoughts are, once you start to write them out.

Tackle writing as an engineering venture. Right there's where most fall down. Far too many engineers, believing themselves on unfamiliar ground, set out to write with an abandon and disregard of order which would leave the most Bohemian of artists goggle-eyed. In short, they think they're artists. They forget they're engineers.

All right then. You're an engineer, about to write about an engineering subject. What, exactly, are you going to tell? To whom, exactly, are you going to tell it? Those questions you must answer before you start.

Suppose you were about to build a power line. Would you start ordering equipment before you knew capacity or voltage? Would you build the line at all without first making some estimate of customers to be served? No. But too many technical writers plunge into their subject as though the answer to both was yes. They take pains to explain a fundamental that every engineering reader understands—like adding copper to a line that's not nearly loaded up. Or they drag in incidentals which add nothing to the main point—like building branches when the only customers are on the main line, at the other end.

Define your subject. Isolate the important thing you have to tell. Draw a sharp line between material that does, and material that does not, fall within its scope.

Estimate your readers. You are writing for them. Where will your paper be published? Whom will it reach? How many of these will care about your subject? How much do they know about it already? Draw a sharp line between material you need, and don't need, carefully to explain.

Now you know who you're talking to and, roughly, what you want to say. Don't, however, start chewing your pencil yet. In an engineering project, you work with specs and blue prints. Unless your imagination is colossal, and your memory a giant, you'll need something like that when you write.

Frank Taylor, whose articles you've doubtless read in the *Post* or *Collier's* or other magazines, always works from an outline, and he's an expert in his field. He uses a 2 x 3-foot sheet of paper, ruled in columns about 4 inches wide, and his outline proceeds from left to right. That's an idiosyncrasy. The piont is, what kind of outline does not much matter. Using some kind of outline does.

All right. The awful moment is approaching. So far you have done three things:

1. You've rejected the fallacy that technical writing is a mystic art, something to be dealt with in a mysterious way. You've recognized it as an engineering project, something you can master as an engineer.

2. You've identified your subject and your audience, and you're going to forget neither until your writing's finished.

3. You've organized essentials into sequence. That is, you have a plan.

The next step is to begin at the beginning, head straight for your objective (and that means no detours or doubling back), and stop when you've arrived. And there you have your paper. Now you simply sit back and wait for the applause.

What? You don't believe it? Well, look more closely, and you'll probably come to agree.

Begin at the Beginning

It is not necessary to begin your paper with a short (you may think) history of the electric industry or a reference to Benjamin Franklin and his kite. Unless, of course, one or the other is your subject. And heaven help you on such subjects unless you have something really significant to add.

It is safe to assume your reader knows your subject is within the electrical engineering field (depending on where your paper is to appear). Your point is to focus his attention just as quickly as you can. Because you don't want him to stop reading, and you do want him in a receptive frame of mind.

You will have made a good beginning, therefore, if you have, within a paragraph or two: indicated your subject, suggested what you're going to tell about it, and (if possible) pointed out how the reader may benefit by reading on. Not as a model, but as an adequate example, refer in this article to paragraphs one and two.

The beginning of your paper is the most important. For that reason it de-

serves especial care. Dr. N. A. Bowers, Pacific Coast editor of *Engineering News Record*, says he often spends more time on the first paragraph than on the next 600 words. Some writers write the beginning last. Others, like Dr. Bowers, feel that a good beginning is a good foundation on which to build the paper. Take your choice.

Here's the first sentence of a paper published not so long ago. It's an example of how not to begin:

"Considering recent trends in the modernization of rural pole lines, pole line hardware, transformers, metering, in fact, in nearly every phase of the power industry, it may be of interest to consider a modern method of pole inspection."

Of the 38 words, "pole inspection trends" are the only ones that count.

Two hundred words more (200 less readers), and the writer came to his beginning:

"A simple method has been developed which will give a definite answer as to the strength of a pole and will take very little more time to perform than the methods of inspection sometimes used at present."

He might have said it this way and reduced the wordage by 35 per cent:

"With but slight increase in pole-inspection time it is possible, by a new method, definitely to determine the strength of a standing pole."

End at the End

Far too many papers have the meat in the middle, like a red-hot in which the bun is longer than the dog. You, however, have started with the end in view. You can't overshoot it by mistake.

To be good, the ending should be self-evident as such, but it should not give the reader the feeling he has closed the book. The ending may summarize or forecast, or both, and should gather all the loose ends into one tight knot. It might imply something like this: "Here, then, is the evidence—today it means so and so—will it mean such and such tomorrow?"

Some writers use a "circular" ending to good effect. The ending closely resembles the beginning, but the reader's viewpoint is altered in accordance with the facts that he's just read. The reader has completed a sort of cycle, but emerges with a fresh slant.

Suggest a new perspective or a new thought, and it will help to give your ending punch. Leave the reader thinking. Don't lull him off to sleep. And if you can't write an ending without straining, simply stop. Better that than to continue while your own ideas, and your reader's interest, dwindle and disappear.

Edgar Allan Poe wrote for a leisurely public, not for busy engineers, so his need to hold his wordage down was slight compared to yours. But he monkeyed with no incidentals. He began at the beginning, and he ended at the end. In his story, "The Masque of the Red Death," this is the beginning:

"The Red Death had long devastated the country."

And the end:

"And Darkness and Decay and the Red Death held illimitable dominion over all."

Engineer It All the Way

Now that you've got your terminals —your end points—you must engineer the distance between. As a guide, you have your outline, or your plan.

If you were building a transmission tower, you'd build from the bottom up —a turbine, perhaps from the inside out. So in your paper. Your description may proceed chronologically, or geographically, or along an electrical circuit, or through a sequence of functions, or from large units down to smaller ones. Your subject and material will indicate the appropriate system. Just which one it is matters little as long as it is a logical system, along which your reader's mind can "track."

Be efficient. Extra generators are not added in a power house to increase the beauty of the plant, nor are 100,000 kva. installed where 50,000 kva. will do. Likewise in your paper. Make every unit work.

Here are a few examples. Don't say "in actual practice"—the realm of actuality is assumed. Don't say "facts and data"—the distinction is too fine. Don't say "at the present time"—say "at present," or better, "now." Keep your sentences short and don't use a long word if a shorter word will do. Go back over your paper and cut out every redundant word you can find.

Know your units. Few engineers attempt to carry every conversion factor, serial number and name-plate rating in their heads. Similarly, it's no crime to write with a dictionary on your desk. Or to refer to it now and then.

Choose words to express your ideas, don't force your ideas into hackneyed expressions of the trade. How is your reader to guess that a fresh viewpoint is hidden in the same old phrase?

Do not, however, abandon standard patterns and standard units unless you are highly skilled. Use simple words correctly. Use simple sentences, put together well.

There you have the engineering principles of writing. You: follow a logical procedure, maintain efficiency as a constant goal, choose your units carefully, check their meaning, then assemble them in accepted ways.

Refinements

You are never under any obligation to bore your audience to death. Through years of reading the dullest kind of writing, engineers have developed an astounding capacity to take it. That's a break for you. But don't abuse it. Public opinion notwithstanding, engineers are human and can stand only so much.

Relieve the monotony now and then. You can do this with an incidental if it's VERY SHORT. Don't, however, begin by saying, "It is interesting to note." Nobody will believe you, and if it really is interesting your readers will be able to discover that for themselves. You can break the pace with a partial summary. Deliberate repetition adds emphasis if the same thing is said in different ways, and the partial summary gives the reader the encouragement of knowing exactly where he stands.

The partial summary preceding "Begin at the Beginning" is an example and states points 1 and 3 for the third time, and point 2 for the fourth.

Humorous touches are helpful, if appropriate, and if you are sure they're funny. If you are not dead certain, leave them out. Annually for the past ten years, one out of every twenty engineering papers has contained the quip: "Like Topsy, it just grew." That gag is getting pretty tired now, so let it rest. Frankly, it was no belly laugh the first time it was said.

As in the whole paper, the most emphatic parts of paragraphs and sentences are the beginnings and the ends. In the paragraph, terminals are usually the best positions for "topic sentences," which can be used to sum up or set the key note of the paragraph, to give it point. In a sentence, you may be able to emphasize an important word by shifting it to the beginning or the end. In this paragraph, the first is the "topic sentence," and here is an important pair of words, placed in the terminal position.

For all-round improvement in your writing: read. "Reading maketh a full man," as Bacon has already said. Reading will improve vocabulary, and you will unconsciously absorb technique. For complicated science in simple terms, read "The Universe Around Us," by James Jeans; for excellence in structure Emerson's "Essays" are good; for straight-from-the-shoulder writing with some rugged romance thrown in Robert Louis Stevenson is hard to beat.

But don't go literary. Remember you're an engineer passing on your special knowledge to someone else. Remember your strong points are accuracy and a carefully planned approach. As you improve with practice, you'll find the best of any kind of writing requires, for its execution, little more.

Gage

About the energy consumed by farm electrical applications

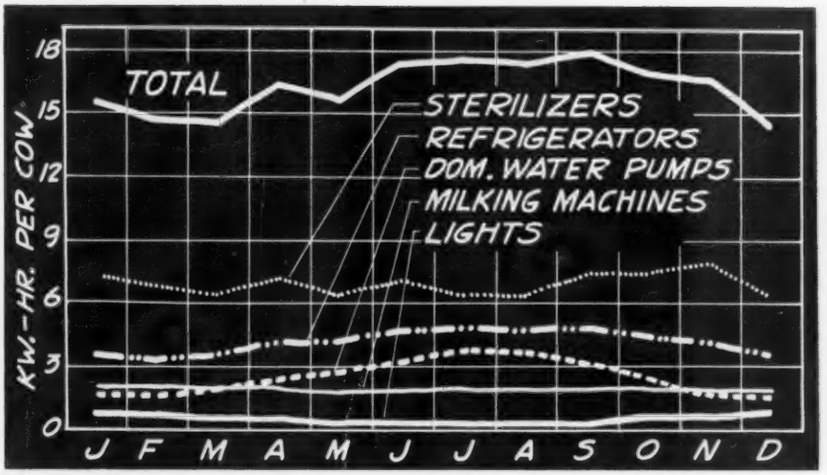
To furnish a gage of the potential market for electrification and to provide rural power salesmen with average figures which can be used in selling various electrical applications, the California Committee on the Relation of Electricity to Agriculture has conducted a two-year survey of 30 dairy farms. Purpose of the survey was to determine the energy consumption of each of the different electrical applications on electrically equipped farms.

Dairies selected varied in size from 30 to 150 cows. Not all the farms were completely electrified, but information was secured by sub-metering consumption on 15 refrigerating units, 13 milking machines, nine domestic pumps, nine electric sterilizers and four sets of dairy lights. Meter readings for each individual application were taken monthly. These were compiled at the conclusion of the study to show monthly and yearly averages on the basis of kw. hr. per cow (see graph).

Connected load of sterilizers ranged from 5 to 15 kw.; average consumption per cow per month was 8.9 kw.-hr.; connected load of milking machines ranged from 0.5 to 3 hp.; average consumption per cow per month was 2 kw.-hr.

Connected load of refrigerators ranged from 1 to 3.25 hp.; average consumption per cow per month was 4.1 kw.-hr.; connected load of domestic pumps ranged from 0.5 to 3 hp.; average consumption per cow per month was 2.7 kw.-hr.; connected load of lights ranged from 0.5 to 0.8 kw.; average consumption per cow per month was 0.5.

Use varied slightly from month to month, more refrigeration for milk cooling and more water being required during the summer.



Average monthly energy consumption per cow for various equipment on 30 dairies

Muskmelons

Are now propagated by electric heat instead of wood or oil

By G. H. BLIESNER
Agricultural Engineer
Portland General Electric Co.

"The use of wood or oil to heat a greenhouse for propagating muskmelons cannot compete with the use of electric heat," says George Asher, melon grower on Green Island, Ore.

In the past, Asher used approximately two cords of wood to heat his greenhouse. The wood stove was at one end and the flue extended the entire length of the building. Now he uses soil-heating cable.

The change was made in the spring of '38, when the stove was removed and the cable was installed in one of the 4x45-ft. greenhouse benches. No heat was applied in the other bench.

Preparing the heated bench, Asher put approximately 4 in. of sand in the bottom of the bed. The cable was run through the sand 2 in. from the top. Planting practice has been to place fertile pulverized soil in bottomless hallocks which are 2 in. square and 4 in. deep. These hallocks are put into garden flats. Four to five melon seeds are sown in each hallock; then the flats are placed on top of the sand in the greenhouse bench. In making his first test of soil-heating cable, Asher followed the same cultural methods with both benches.

A soil temperature of 60 deg. F was maintained in the heated bed by a thermostat. Room temperature was, of course, the same for both beds. But the results—

In the electrically heated bed the melon-seed propagation was over 95%; in the unheated bed, it was less than 50%. Furthermore, the heated bed's plants were greener and sturdier and they developed more rapidly. Three weeks before the melons from the unheated bed were marketed, the melons from the heated bed were on their way to somebody's table.

Cooled Hens

College studies value of air-conditioning poultry houses

By J. R. TAVERNETTI
Division of Agricultural Engineering
University of California, Davis

High summer temperatures in the interior valleys of California often result in excessive hen mortality and decreased egg production. In order to determine the feasibility and value of cooling poultry houses, therefore, an experiment was conducted at the College of Agriculture, Davis, during 1938.

Although some interesting data were obtained, no definite conclusions can yet be drawn. So it is planned to repeat the experiment this year.

A regular University-type poultry house, 16x18 ft., is equipped with an evaporator cooler capable of giving one air change a minute. The cooler is placed in front of the house, which is insulated only by closed curtains. A thermostat turns the cooler on when the temperature in the house is 85 deg. F., and off when it is 80 deg. Used as a check is a non-cooled house of similar size and construction.

Last year 90 fall-hatched hens were put in each house on April 1, and kept there until Jan. 1. During this time records were kept of egg production, mortality, weight of bird, weight of eggs, food consumption, temperatures and electrical energy consumption.

Average egg production for the entire period was approximately the same in the two houses, but the distribution of the production was markedly influenced by the cooling. Up to the end of June the production was similar. During July, August and September production in the cooled house was higher. This was reversed in the last three months.

Mortality in the cooled house was lower than in the check, and the hens were noticeably more comfortable. Weight of hens and eggs and the food consumption was, however, about the same for both houses.

No trouble was experienced in maintaining a temperature of less than 90 deg. in the cooled house, even on days when the outside temperature was as high as 110 deg. Electrical energy consumption for the entire period was 75 kw.-hr., which would cost about $1.50.

What? ANOTHER OGPU?

CARTOON BY CLOYD SWEIGERT

DEMOCRACY, as defined by President Roosevelt in his Jan. 4 message to Congress, "is a covenant among free men to respect the rights and liberties of their fellows."

No one quarrels with this excellent definition. And if the Administration reflected that principle, the business men of the nation would have no quarrel with it either. It is because some departments of the government exhibit a spirit so contrary to this principle that business finds itself confused and unable to plan. The construction industry, electrical contractors cite as a case in point. It is now plagued by restrictions on PWA bidding that taste more of dictatorship than of respect for "the rights and liberties of their fellows."

Avowedly intending to prevent collusion and price fixing in the submission of bids for PWA-financed public works, the Administration sets up restrictions which legal counsel for the contractors maintains goes beyond the law and violates the Constitution. What is more, contractors report that a private spy system has been established to do by intimidation what the administration of PWA has no legal right to do.

Reversing the basis upon which American law is founded, namely that a person is presumed to be innocent until proved guilty, the requirements of the PWA assume guilt and then dare the construction industry to prove itself innocent.

One of the great evils of sharp practice in the construction industry is that known as "shopping for bids." Under every construction industry code of the NRA this practice was labeled and condemned. Briefly, it consists of accepting bids from sub-contractors, and after obtaining the general contract, of taking the low bid to other bidders in an attempt to get them to rebid at an even lower figure. The profit from such a transaction is kept by the general contractor rather than passed on to the customer.

To prevent this type of chiseling, bid depositories have been set up in several cities of the West. Legally established and carefully administered, these depositories limit themselves to one thing—the filing of a duplicate bid to be opened *after* the bids are officially opened, and compared then with the bids submitted. Since the bids thus submitted are held until a definite opening time, and after opening the results are tabulated and made public, the practice of bid peddling is discouraged.

Under state laws these depositories are permissible. Under California Fair Trade laws they are still further encouraged as a means of preventing selling below cost. But evidently in the eyes of the PWA nothing can be honest if it has the taint of business upon it, contractors charge. In a letter received by Walter J. Walsh, attorney for the San Francisco bid depository, incorporated under the laws of California, H. A. Gray, assistant administrator of PWA, Washington, D.C., exposes this attitude in the following words:

"The Public Works Administration has found in its experience that the mere operation of a bid depository did not afford us the assurance that collusion in bidding would be avoided, because of the fact that the submission of bids to any source is always a means of escape of information concerning such bids.

"For this reason a statement that a bid depository has not been used in submitting bids is required in our non-collusion affidavits, which every successful principal contractor and awardees of subcontracts on PWA non-federal construction in the State of California must execute."

As a further indication of PWA's distrust of business, a corps of investigators has been put into the field to snoop out suspicions of collusions and pry into business affairs, contractors in cities throughout the West report. With the prestige of government agents to back them up, these investigators are going far beyond the rights of government under law.

Sincere association officers, in an effort to prove their good faith, have opened their books and proceedings to such investigators. Having nothing to conceal, they have felt that their sincerity was proof against misuse of the information. In the light of some of the kinds of information which these investigators have taken with them, there is a grave question as to the motive of the PWA itself in seeking such information.

In Seattle, for instance, the PWA investigator took a record of correspondence which related to protests members of the contractors' association had made to their congressmen and senators and to the Director of Procurement. Obviously, contractors assert, the purpose of such seizures of records is not to prove collusion, but to intimidate the association and its members in order to discourage further protests to their congressmen.

Speaking of this illegal investigating, Attorney Walsh comments as follows:

"In going into this situation we sometimes lose sight of certain definite

fundamentals. The first is that everything which the affidavits mention is absolutely legal under the laws of the State of California and I presume, under the laws of other states. The only thing a contractor could be punished for, if his affidavit did not state the truth, would be for making a false affidavit, not for doing any wrongful act. (The affidavit usually requires a contractor to swear that he has not colluded or communicated with anyone or submitted his bid to any association.)

"As an American citizen and quite separate and apart from trade associations, I look with great apprehension upon each separate division of the federal government maintaining its own bureau of investigation. I see a perfectly legitimate field for the War Department and the Navy Department to maintain its own special bureau of intelligence for its own service, but I am inclined to believe that the Federal Bureau of Investigation should be the sole bureau set up for the federal government to enforce or to seek evidence working toward the enforcement of violations of federal laws.

"For any act which is criminal, there is ample authority in the hands of the U.S. District Attorney in each district in the U.S. to take action. Any citizen or any department of government that feels wronged by violation of federal laws, in a matter covered by federal jurisdiction, has the right to go before a federal grand jury in the district in which the violation took place and lay a complaint before this jury. The same holds for state laws, except that it is with a county grand jury that the complaint is lodged.

"The Department of Justice has always been willing to cooperate with any citizen who had a lawful grievance, and that includes any department head or officer of any department of the federal government. I see no reason for the maintenance of such a secret police by the PWA, and the affidavit is, when looked at objectively, a perfect example of the weakness of their position. Its only reason for existence, insofar as I can see, is to assist the large general contractor to beat down the bid of a sub-contractor. No saving to the federal government is contemplated, nor can a saving to the federal government be shown by the filing of such an affidavit."

As to the obtaining of records and correspondence of an association, such as those taken in Seattle, two articles of the U. S. Constitution are violated. The first is Article I, Restrictions on Powers of Congress; Section 1, Freedom of Religion, Speech and Press:

"Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof, or abridging the freedom of speech, or of the press; of the right of the people to assemble and *to petition the government for a redress of grievances.*"

If Congress has no authority to make such law, certainly no subordinate body of the federal government has any such authority.

Article IV, of the Amendments, known as the Bill of Rights, under Seizures, Searches, and Warrants; Section 1, Respect for Privacy and Property Rights and Regulations:

"The right of the people to be secure in their persons, houses, papers and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue but upon reasonable cause, supported by oath or affirmation, and particularly describing the place to be searched and the person or things to be seized."

The remedy for this situation, contractors maintain, does not seem to lie in protests to the Administration that these are violations of the Constitution. The only remedy—and that must be applied before it is too late and the governmental OGPU spreads—is to continue to petition congressmen and senators to act. The proper committees in the House and Senate should be told of the damage to liberties that these private and uncalled for investigating bureaus do; the burden such excessive personnel creates upon taxpayers, and the fact that these bureaus should be unnecessary since the government has in its Department of Justice a department of criminal investigation legally empowered to take care of any violations of the federal law.

If action of this sort is not initiated without delay by contractors' associations throughout the West and east, one of the warnings President Roosevelt himself voiced to Congress in the closing lines of his message will come to pass:

"Dictatorship, however, involves costs which the American people will never pay: . . The cost of the blessed right of being able to say what we please. . . The cost of seeing our capital confiscated. . . The cost of being cast into a concentration camp. The cost of being afraid to walk down the street with the wrong neighbor. . ."

Light for Office Workers and Students

Two commercial lighting installations which meant money for the contractors and better seeing for office workers and students: Above is a section of the general offices of Pacific Manifolding Book Co. The job, installed by Pacific Electric Motor Co., Oakland, gives a uniform spread of light without glare and shadows. Below is a new Provo, Utah, school. As a result of exhaustive tests in another school room, every classroom in this school was equipped with phototube controls, set to assure students at all times a minimum of 20 ft.-candles. In the test room, the inner row of lights burned an average of 2.7 hr. per day during the darkest season of the year. The room supervisor reported discipline was greatly improved by the light

Protection

Is what Bakersfield gives its swimming pool lights

Winter is almost over, but the City of Bakersfield, Calif., may well be happy that it took pains to protect its park lighting facilities from small boys with air rifles and sling-shots. Replacement of glassware, lamps and underwater units for swimming pools is expensive.

City Electrical Inspector D. R. Meikel and Bakersfield Electric Co.'s Gene Gartley were responsible for these protective measures. In setting up a lighting system for a large swimming pool at one of the city's public playgrounds, they worked out a design which provides for removal of equipment during the winter—the one time when the pool is without supervision.

Two systems of lighting are used: one under-water, the other on standards around the pool. Each of the twelve standards, which make up a part of the steel fencing round the pool, mount one 750-watt Mazda unit and one 750-watt mercury-vapor unit. The transformer for the mercury unit is mounted at the apex of the standard (see cut).

The standards are sections of steel pipe swedged together, galvanized and imbedded in the concrete walk. Drilled into the base of each pole is a hole, threaded and fitted with a ¾-in. nipple which connects to the back of a weather-proof outlet box covered with gasket head fitting. This box is about 4 in. from the concrete walk so that water used in washing off the walk will not get into the outlet. It is used as a pull-box and for connection of the feed to the lighting units above.

Under-water units are so arranged that they may be disconnected by a twist-lock, water-proof plug and receptacle and withdrawn from the concrete housing. Gasket-fitted brass plates in the walk provide access to the connections between the under-water units and the wiring system.

Control of the lighting is centered in the water-purification room under one end of the swimming pool area. A 200-amp. main switch in a multi-breaker cabinet of 12 circuits distributes to the individual 30-amp. lighting circuit. An underground feeder brings service from the pole up the street some distance.

Because of the corrosive condition of the soil, an unusual method was used to protect the underground circuit. A 6-in. case of oiled sand was tamped hard around the conduit. When it cools and hardens, this sand becomes something like asphalt paving. It therefore does a good job in protecting the conduit, which otherwise would be destroyed.

When removing the glassware, lamps and under-water units at the end of the swimming season, park attendants even go so far as to substitute wooden covers for the glass plates in front of the under-water units. Result: The pool is tough pickings for the sharp-shooting youngster.

Gene Gartley points to the brass plate covering the connecting box for the under-water lights at the Bakersfield swiminmg pool. Note transformers atop poles (already prepared for the siege of winter sharp-shooting) and outlet boxes at base.

Agenda

What various associations have done and will soon do

Following organizations held meetings recently and will hold more in the future. Herewith the programs, speakers, purpose, etc.

Old Baldy Chapter, NECA—Meetings held every Thursday from 7 to 9 p.m. in the council chamber at the Pomona, Calif., city hall. Purpose is to study the NECode. F. H. McMahon and F. A. Short are speakers.

Santa Barbara Chapter, NECA—An electrical industry dinner was held Feb. 3rd; regular meetings on the second and fourth Thursdays at 261 LaArcada Bldg.; code schools on Feb. 13 and March 15. H. Dobson, Santa Barbara inspector, speaks on the code.

Electrical League of Utah—Samuel J. Rosch, director of research for Anaconda Wire & Cable Co., spoke Feb. 1 on "Future Trends in Insulated Wires and Cables."

Electrical Contractors' & Dealers' Assn. of San Joaquin County—Regular meetings on the second Monday of each month at 218 Elks Bldg., Stockton.

Southern California Chapter, IAEI—Six city electricians of southern California spoke Feb. 1 in San Diego on electrical inspectors' problems. Meetings are scheduled for March 29 in Beverly Hills and May 24 in Long Beach. More inspection problems will be discussed.

Southern California Section, IES—Members made trip Feb 14 through NBC studio, Los Angeles.

Adequate Wiring Bureau of Idaho—Wiring schools held in Payette, Boise, Twin Falls and Pocatello Feb. 6, 7, 8 and 9. Hans Hulbe, head of the Boise-Payette Lumber Co.'s architectural staff, spoke on adequate wiring from the architect's viewpoint. Twelve wiring schools were held in January. Speakers were W. H. Volheye, chief electrical inspector for the Oregon code authority, department of labor; Ralph Colburn, Westinghouse Electric, and Frank Young Jr., Westinghouse Supply, Salt Lake City, and Kyle M. Waite, Waite Electrical & Ignition, Twin Falls.

San Francisco-Bay Cities Section, IES—Prof. D. D. Davis, University of California, spoke on progress in roadway-illumination measurements from headlights; H. Thal-Larsen, on "Reflection of Fog in the Visible Region." Members witnessed laboratory demonstrations under direction of F. A. Ryder in the University's illuminating labs.

Fresno, (Calif.) Electrical Contractors' Assn. and the Electrical Dealers' & Jobbers' Assn. of Fresno—H. G. Ufer, Underwriters' Laboratories, presented the film, "Approved by Underwriters," at the Feb. 7 meeting. H. C. Hollingsworth, contractors' president, presided. C. T. Coyle, Fresno electrical inspector, made arrangements.

Wholesalers

Fiesta spirit, improved outlook break meeting's decorum

The business outlook is improving, members of the Pacific Division, National Electrical Wholesalers' Assn., decided at their annual meeting in Del Monte, Feb. 15-17. One substantial proof of this new confidence was the ease with which a group of bewhiskered, cowboy-hatted utility executives, reflecting the fiesta spirit of the Golden Gate Exposition opening, broke the decorum of the session.

A. C. McMicken, Portland General Electric Co., answering queries about his company's new non-merchandising policy, said that the move had been made because the other Portland company had ceased selling, new public-utility accounting made it necessary to show a profit and the company wanted the friendship of all dealers. Results last year, he said, proved the plan worked.

J. E. E. Royer, Washington Water Power Co., boasted that, since the government had been pouring money into Grand Coulee Dam, there had been no depression in his territory. He felt that the big job of the utilities today was that of convincing the public they were better public servants and more capable of distributing federal power than the government.

Wholesalers George Watson, Phil Carson, Al Nicoll and N. J. McDonald enjoy some golf

L. A. McArthur, Pacific Power & Light Co., told how realization of the effect of tax exemption was beginning to effect a new Northwest attitude toward Bonneville. Just what the proposed power lines would do to existing business he would not predict.

Clyde Houston, Southern California Edison Co., commenting on home-building, asked whether model homes now displayed are really models of electrical convenience. More copper in the home, more simplicity in obtaining it and more coordination of industry effort to sell it are needed, he said.

R. E. Fisher, Pacific Gas and Electric Co., gave the customary prognostications of the business potential for this year.

E. G. Stahl, San Joaquin Power, described in detail the $8,500,000 appliance, equipment and wiring market in his company's territory.

O. R. Doerr, P. G. & E., reviewed the budgets for company and dealer sales

TODT ENGLAND

in the 11 Western states and urged the wholesalers to assist in the cooperative work of making better salesmen of dealers.

More plain-spoken than ever, Dr. G. W. Allison, national field representative of the Modern Kitchen Bureau, asserted that "the rock-ribbed base of all business is the serving of human need," and that the public is a silent partner in all business. The only right a business man has is that of public sufferance; the public can put all business on the rocks whenever it chooses. The politicians have out-appealed and hence outsold business to the public. In order to regain its position, business must quit competitive bickering, coordinate its forces and appeals and outsell the politicians again. Citing the refrigeration campaigns as examples of successful operation, he urged the creation of leagues or other agencies which would coordinate industry effort in each community.

At the first open session, the wholesalers were addressed by R. E. Smith, Southern California Edison Co., who gave a resume of the recent PCEA industry-education program. Phil Carson, Graybar Electric Co., Los Angeles, spoke on the wholesalers' most difficult problem, that of small, costly and unprofitable orders.

N. J. McDonald, Thomas & Betts, Elizabeth, N. J., gave a level-headed analysis of business conditions. He threw in the "but" of the unpredictability of the European situation. Most companies, he said, are budgeting more than last year, his own a 15% increase.

In the closed sessions, election of officers resulted in the selection of Fred Todt, Los Angeles manager of General Electric Supply Corp., as chairman. Henry I. England, retiring chairman, was elected to the executive committee of NEWA. Albert Elliot was reelected secretary-treasurer.

Al Phillips, Incandescent Supply Co., was in charge of the golf tournament; W. W. Glosser, Hubbard & Co., presided over the golf banquet.

Club Center

How a community store meets the competition of downtown dealers

As a community store on the outskirts of Portland, Harry Black & Son Furniture Co. has to meet the competition of the big downtown department stores and appliance dealers. The owners are doing this—and getting rather more than their share of business—simply by thinking up one merchandising idea after another.

One of the best of these ideas is the "club center," utilizing some spare space on the rear of the mezzanine floor.

This space, 90x10 ft., is partitioned off into three sections. A small retiring room is at one end. Next is a 10-ft.-square model kitchen complete with electric refrigerator, range, sink and built-in cabinets. (This equipment is the same as that sold on the appliance floor, is new and of the latest style.) Finally comes the club room, which is furnished with a few easy chairs and plenty of card tables and folding chairs.

The whole layout is turned over to women's clubs and other organizations for meetings, card parties and luncheons. No charge is made, the store even paying for heat and electricity.

"Aside from the space, which we put no particular value on because we could not use it to advantage otherwise, the actual expense is not over $5 a month," the senior Black explains. "But look what we get out of it!

"We extend the facilities on regular schedule to such organizations as mothers' clubs, social clubs, women's auxiliaries of fraternal groups, etc. Some of them already have halls at their disposal—as for instance, the fraternal auxiliaries—but they'd rather come to our cozy, compact quarters than open up a large hall for a small gathering.

"The meetings are scheduled at all times of the year, heaviest in winter. I figure that, on the average, at least 150 women use the facilities every week. The personnel of the meetings is always changing to a certain extent, for the clubs have a total membership of perhaps a couple of thousand, and most of this membership gets here at one time or another.

"Almost always they serve refreshments and use the kitchen, keeping their own tableware, linen, and so on in their lockers. The result is that they are continually using the electrical equipment and coming to favor the kind we handle because they find out its good points for themselves through actual use. They practically sell themselves on our line; but we do not kill the effect by hounding them for business.

Club-Center Originators Harry Black & Son

"Everything else being equal, and our equipment being satisfactory, why shouldn't they patronize us when the time comes to buy a range, refrigerator or other electrical appliances? I find that it works out that way in a great many instances. We have traced many sales directly to this club center idea and the friendships created by the plan."

Salaries

Two utilities take steps to stabilize their salesmen's pay

Power companies face two problems in paying a salesman: They must reward him for high production but protect him against business swings by giving him a salary on which he can count ahead. They must help their dealers and preserve their friendship by preventing the utility salesman from making more than his fair share of sales.

Obviously the problems are conflicting. Montana Power Co. and Washington Water Power Co. have, however, worked out satisfactory solutions.

Montana's plan, developed largely by I. L. Comstock, assistant to the vice-president, was inaugurated last June. It provides that at the end of each six-month period the company will determine from his performance during the preceding half year exactly what monthly salary each salesman will get in the subsequent half year.

First of all, a top salary was established—$300. Next, the limits of variation of a salesman's monthly salary for a given six-months' period was fixed—$25 maximum monthly increase; $50 maximum monthly decrease. Then came the problem of determining salary increases and decreases for each salesman on the basis of his individual production, measured not only against his own previous showing but also against the showing of the company's whole sales force.

In order to find this, the e.a.r. record of a typical, top-salaried salesman was taken as a base. This man earned $300 per month during the first six months of 1938. His e.a.r. for this period was $3,062, or $510 per month.

Dividing his salary by his monthly e.a.r. gave 59c. This was the factor which was applied to the e.a.r. of each other salesman.

Salesman B, for instance, earned $160 per month during the first six months of 1938. His e.a.r. was $2,246. Reducing this to a monthly basis and applying the 59c factor, you get $221. Salesman B therefore qualifies for maximum increase. His salary for the second half of 1938 was fixed in advance at $185.

Salesman C, who earned $300 per month in the first half of 1938, showed a calculated salary of $212. He, accordingly, was subject to a maximum decrease, and his salary was established at $250 per month.

That this compensation plan is working out as hoped is evidenced by the approval of the salesmen themselves. They are contented. Success of Washington Water Power's similar plan is consequently almost assured.

Washington's plan became effective Jan. 2, 1939. As in the Montana scheme, total e.a.r. credited to a residential salesman over a six-months' period determines his salary for the next half year. Unlike Montana's scheme, the schedule of salary payments is set.

If a salesman showed an e.a.r. of $1,100 during the previous six months, he gets paid $125 per month during the next six months; e.a.r. of $1,300, salary of $150; e.a.r. of $1,600, salary of $175; e.a.r. of $2,000, salary of $200; e.a.r. of $2,700, salary of $225; e.a.r. of $3,760, salary of $250. At no time may a man's salary be raised or lowered by more than one step.

New salesmen are paid a straight $75 per month during a training period of not less than six months. After that, they get $100 per month for 12 months. Then, provided this e.a.r. accomplishment and performance rating for the previous six months justify it, they are eligible for $125 per month.

In one way the Washington plan goes far beyond the Montana plan. That is in the rating of a salesman's performance of duty.

In determining this, the company considers the following factors: (1) General conduct of the salesman with respect to dependability, punctuality, resourcefulness, honesty, willingness, interest in work, attitude toward coworkers, personal appearance. Rating is up to 20%. (2) Spirit in which the salesman has carried out assignments given by his superiors. Rating is up to 20%. (3) Ability of the salesman to

make friends for the company from every customer contacted. Rating up to 20%.

(4) Ability of the salesman to sell the company's various services and maintain good dealer relations. Rating up to 20%. (5) Balanced loadbuilding performance. Rating up to 15%. (6) Seniority with company. Rating up to to 5%.

Each salesman's performance is graded every six months by the division manager and division sales manager in collaboration with the assistant general manager in charge of sales. If his rating is less than 75%, he is not eligible for a higher salary even though his e.a.r. is sufficient.

Talking Dog

Pedestrians stop, listen when Sanders Electric's dog speaks

An amusing advertising novelty which pays dividends is the large model of a fox terrier, with head cocked and ears intelligently pointed, placed directly in front of the entrance to Sanders Electric Co., Albuquerque, N. M., appliance store.

At intervals the animal addresses approaching pedestrians with a cheery word of greeting, a comment on the fineness of the day or some other appropriate remark. The effect is naturally startling, and the firm has found it an excellent means of attracting attention to the store and of securing the names of prospects.

The arrangement is very simple: A loud-speaker, concealed in the dummy dog, is directly connected to a microphone within the store. The ready wit and glib tongue of Victor Sanders, head of the company, completes the setup.

Beehive

Many are the activities of the L. A. Bureau's sales department

A beehive of activity is Los Angeles Bureau of Power & Light's 21st and Figueroa Sts. building. More and more the building, an old automobile-dealer's showroom, is becoming the headquarters for bureau promotion and dealer work.

Ground floor, including a portion of the large window space, is occupied by the electric-range and water-heater testing platform. When a dealer sells a range in Los Angeles, he notifies his distributor, who delivers the uncrated range to the platform. After thorough checking and testing, the range is then sent to the customer by one of a fleet of special trucks.

Another testing department is the test kitchen, in which recipes and cooking methods advocated by bureau home economists are tried out. These recipes are distributed to dealers and customers on request. Also tested here are ranges sent in by manufacturers. Any defects in the operation of the range are reported to the maker so that he may correct the fault and turn out a better product.

Classrooms on the second floor are given over to various kinds of cooking and training classes. One set of classrooms houses John Stigman's cooking schools for dealer salesmen. This activity is going into its fourth year. So valuable has been the instruction that salesmen often return for additional training.

Another set of classrooms is used thrice weekly by the extension Division of the University of California at Los Angeles. Both members of the industry and the public are invited to attend. Instruction covers kitchen planning; dietetics; home economics for appliance demonstrators; electrical appliance fundamentals for demonstrators, adjusters and repair men, etc.

"Functions of the Kitchen" is the subject of the kitchen-planning course conducted by Associate Professor Greta Gray. The course furnishes instruction on kitchen work centers and their relation to each other and to the dining table, supplies and utensils, storage spaces, cupboards, work surfaces, lighting, etc.; connections between kitchens and other parts of the house; plan drawings, and kitchen finishes and decorations.

Dr. Martha Davis presides over the home economics course for demonstrators. She teaches nutrition and the economic principles of meal planning, food preparation and sanitation, problems and practices in table service for formal and informal occasions and efficient management of the kitchen.

Electric-appliance fundamentals are taught by Thomas A. Watson.

All dealer meetings are now held in the building. In presenting such a meeting, the bureau staff, under Chet Dye, usually prepares a real show. The display department assists in backgrounds and show cards.

Whenever a dealer group from any section of the city is called to a meeting, the representative in that district contacts the dealers and invites them to this central headquarters. This system, obviating the necessity for finding adequate facilities in poorly equipped halls in other parts of town, has been found quite satisfactory.

A new activity brought to the building and also being tried out at some of the district offices is the prospect round-table group. Range salesmen for the bureau, selling through dealers, invite their best prospects to these discussions. Because of difficulties in giving special attention to those in attendance, the group is generally kept down to 16 or 20 persons. Held in the morning, the meetings are given over to the cooking and eating of a full meal. After the meal, prospects talk, ask questions and get helpful information. Average number of sales following such a class is from two to four.

One activity which does not center in this building is the kitchen planning bureau under Louis Politowski. This service, still maintained at the bureau's commercial offices on Broadway, has grown steadily in importance. And as it has become better known to the building public, it has turned out more and more kitchen plans.

Los Angeles Bureau's model electric kitchen at 207 South Broadway

Making wall-tiles with electric heat at Downey Tile Mfg. Co.

Industrial Sales

Electric heat improves the manufacture of wall-tiles

Wall-tile manufacture today is a far cry from that of yesterday. It used to be that in order to compress the ceramic mixture into the desired shape it was necessary to coat the steel dies with oil which would prevent the mixture from sticking to the dies. This was satisfactory enough except for one thing: since the oil had to be re-applied after three or four tiles had been run, production was slowed down.

Today, however, there is none of these troubles. After tile manufacturers discovered that if the dies were slightly heated they would separate from the mixture perfectly, they resorted to electric cartridge heaters. These are now employed in all modern tile plants.

One of these plants is the recently established Downey (Calif.) Tile Mfg. Co. This plant was built by a group of experienced tile men who were approached by a heating engineer of Southern California Edison Co. and sold on the idea of providing proper facilities for making the most advantageous use of electric-die heating. As a result, a special three-contact outlet was installed at each of the molding presses, and a three-heat switch was installed ahead of the outlet to control the input.

Cartridge heaters are inserted in both the top and bottom of the steel dies. (The wattage rating of these heaters depends on the size of the dies. For a set of dies 4¼ in. square it was found that a 100-watt, 230-volt heater in each die provided satisfactory heating.) With this arrangement two heats are available—a total of 200 watts on high and 50 watts on low. When on medium only one die is heated; this setting is therefore not used for regular operation.

Leads from the heater are connected to a three-pole plug so that when dies are changed the heaters can be left in place in the dies. Different dies can thus be placed in the press, and the heaters connected merely by plugging into the special outlet.

That this installation has made for more efficient tile production is attested to by the plant owners. It would undoubtedly be equally satisfactory to other tile-manufacturing establishments, a good many of which are still molding with more primitive methods of heating.

Ruling

San Francisco cracks down on sale of pin-up lamps

Cheap construction of pin-up or wall-type lamps and the damage caused by their use have called forth a ruling from Ralph W. Wiley, chief of the San Francisco Dept. of Electricity, relative to their sale in San Francisco.

The ordinance provides that the lamps may not be sold unless they meet the following requirements: (1) An approved porcelain or bakelite lamp holder. (2) Where the rubber-covered cork conductors are continuous from the attachment-plug cap to the lamp terminals, the wiring at the terminals must be either covered with a supplementary heat-resisting covering to a point outside the lamp receptacle enclosure or an approved fixture wire must be spliced to the rubber-covered portable conductors behind the wall mounting. Where splices are made in this location, the back portion of the wall plate must be covered with approved non-combustible covering.

(3) Where switches for control of the lamp are installed in the wall plate or mounting, a lock washer must be used to prevent the switch from turning. (4) The flexible cord supplying the fixture must be either secured to the back of the wall plate or provided with a stop to prevent the portable cord from placing a strain on the switch terminals. (5) The portable cord must enter the wall plate or mounting through an insulating bushing or a well-smoothed hole.

Ground Up

Refrigerator dealers fail to put enough stress on features

A high percentage of refrigerators are not sold from the ground up.

This, at least, is the belief of R. C. Cosgrove, manager of Westinghouse's household refrigeration department. For proof he refers to a survey of 10,000 Westinghouse refrigerator buyers.

Says he: "We wanted to find out what influenced the sale of refrigerators and just how the features of 'reasons why' met the customer's expectations after use in the home. Accordingly, we placed a questionnaire in the first 10,000 refrigerators sold last year. We received 1,026 replies.

"In many cases the percentage of favorable mentions of a feature after use were greater than given consideration before purchase. From this we might assume that lack of dramatization or convincing proof was made of the feature's merit at the time of sale, or the purchaser just wouldn't believe until she used it herself. For example, the "meat-keeper," high-lighted in our advertising, was mentioned in 31% of the replies as influence to the sale, yet was given 35% of the mentions after use. In a like manner, low operating cost rose from 27 to 31%; the Humidrawer from 9 to 21%."

A summary of the questions and answers showed the following:

Question: What was your principal reason for making a change to electric refrigeration? *Answer:* Savings, 25%; inconvenience of ice, 24%; electric re-

frigeration is better, 14%; avoid spoilage, 10%; other methods unsanitary, 8%.

Question: What fact impressed you most about your Westinghouse refrigerator that was brought out at time of purchase, or that you noticed in Westinghouse advertising? *Answer:* (On construction) meat-keeper, 31%; exterior appearance, 22%; Humidrawer, 9%; hermetically sealed, 8%. (On operation) low operating cost, 27%; quietness, 10%. (On reputation) Westinghouse name, 18%; advice of friends, 10%.

Question: Now that you have actually used your Westinghouse refrigerator, what features about it do you like best? *Answer:* Meat-keeper, 35%; low operating cost, 31%; quietness, 27%; quick freezing, 27%; Humidrawer, 21%; temperature control, 21%; cube release, 10%.

What Cosgrove and Westinghouse found out through this survey is of obvious value to dealers carrying any make of refrigerator. It indicates simply that dealers can well take advantage of the manufacturers' consumer advertising. That they should study their refrigerators carefully, evaluating every feature. That, finally, they must stress the most important features first; but before the sale is eventually made, stress all the features.

Stressing Ironers

Eleven ironers in nine days: that's Thor Electric's record

Mrs. Virginia Cook, who with her husband operates the Thor Electric Shop in Compton, Calif., lays as much stress on ironers as on any other major appliance she sells. She says it's her belief that the ironer is too much neglected.

All of which might be mere talk on Mrs. Cook's part if it weren't for the fact that she practices what she preaches. And seriously. Without help, she recently sold eleven ironers in nine days.

How does she do it? This way:

All demonstrations are made in the shop, not at home, for Mrs. Cook thinks that too many sales are killed when neighbors talk together and swap ideas. In order to be able to stage a demonstration on a moment's notice, she keeps several dampened shirts in celophane bags always on hand. When she gets right down to the task of showing how easy it is to use an ironer, she starts with the collar and then progresses to other tough spots.

Mrs. Cook makes sure that every prospect learns how to iron before leaving the store. Protests have no standing; in fact, they aren't even heard. Mrs. Cook never stops boosting the good points of ironing. That's the best way, she finds, to overcome objections and to convince the prospect that anyone can use an ironer.

A sale should always be made while enthusiasm is high, for if that psychological moment passes, the sales person must start in again at scratch. High pressure is out of order, Mrs. Cook maintains; but neglecting to seize an opportunity to make a sale is sheer neglecting of business.

After a prospect successfully irons a shirt, Mrs. Cook shows her all the nice little operations that can be performed with an ironer. She shows the prospect how to steam a velvet skirt; how to set the pleats in a dress. She demonstrates the pressing of a man's shirt front and collar a second time.

"Doing all these little operations is very convincing," Mrs. Cook says. "These operations speak louder than words."

She goes on: "Ironers are easy to sell if you learn to use one efficiently yourself. There is nothing in the shop that lends itself better to effective dramatization.

"I keep about three ironers hooked up all the time, and one of these is close enough to the window so that the public sees what is going on. I have in more than one instance had prospects bring their entire washing down here and do their ironing. Never have I failed to make a sale under these circumstances.

"We started this shop four years ago in a small room, 10x12 ft. Today it is five times as large, and we still need room. I believe we have helped all the lines through our attention to ironers. These demonstrations here in the shop are great friend-builders. I find that the customer gets well enough acquainted so that she continues dropping in to see us. That means that her friends and neighbors also get acquainted with us.

"We stock at least three kinds of ironers so the customer can always find what she wants. Hardly a day passes that we don't sell at least one."

Shows & Shows

About manufacturers' exhibits and the Western Merchandise Mart

What the electrical dealer should do in 1939 was told in a variety of presentations, a blaze of showmanship and salesmanship and a continual stream of manufacturer's shows last month. The Western Merchandise Mart in San Francisco also threw in a few ideas via its annual spring market week.

Top rank in showmanship still goes to Frigidaire with its precision-built dramatics. The results must pay. Certainly no dealer or salesman who saw this year's show will forget the action model of the refrigerator cycle blown up to full stage size. Nor will he have much trouble in explaining it to a technically minded buyer.

Frigidaire did another valuable thing for dealers. Not only did it exhibit the full scope of its advertising program, but it also dramatized this from its conception, through its preparation to its intended effect.

In the morning session, R. G. Hutchinson, regional manager, introduced the show troupe headed by L. A. Clark of Dayton, Ohio. Presented at that time were the new standard lines. During the afternoon there were more talks and more skits, in one of which Frigidaire announced that ranges can increase a dealer's business 15%. One out of each ten electrics sold last year was a Frigidaire, it was claimed.

BEICHLER

Surprise of the meeting was the personal appearance of E. G. Beichler, general manager of Frigidaire. Pleased at the response to the show, he promised its continuance.

Westinghouse's show was presented by Rex Larson and Paul Endress of the Mansfield, Ohio, factory staff. Announced was the company's intention to stress the Westinghouse name this year.

Refrigerator features which will be played up are the meat-keeper, the "humidrawer" and the new styling; range features are the time and temperature control on the deep-well cooker and pilot lights in connection with surface units.

Westinghouse's advertising, in four-color spreads, broke early last month. Although main copy was on refrigerators and ranges, the full line of Westinghouse products was mentioned in the margin.

Kelvinator's presentation was a series of small-group shows. Showings were from 1 to 14 days in length; dealers and their salesmen were escorted through the hotel rooms containing the exhibit in groups of 10 to 15. This idea, first tried out two or three years ago, is now followed in practically every Western distributorship.

This year's advertising and promotion will play up Kelvinator's silver anniversary. Refrigerator sales points include a higher capacity unit for faster

freezing, dry storage bin for vegetables, a meat container with glass top and glass tops for the vegetable crispers. An important part of the program is a sales-training plan called the "Kelvinator National Salesmen's Institute."

General Electric's "Get Over Into Clover" show was in the nature of a dramatic play. Theme was built round a typical appliance dealer; action brought out his major problems and showed how they can be solved. Tied into the show was a motion picture designed to tell the story of G-E's research and manufacturing background.

While this appliance show was touring the country, another G-E troupe, composed of company officials, was holding air-conditioning meetings. Two days were spent in each city, the first devoted to a general session for distributors, dealers and members of their organizations, the second a closed session for distributors. Purpose of the tour was to find more merchants to sell air-conditioning equipment and to shape existing distribution channels to fit the market.

In charge of Norge's meetings were Don Donovan, vice-president and general manager; James A. Sterling, advertising and promotion manager; Michael G. O'Harra, vice-president in charge of sales; Jack Tenney, Western sales manager, and local or regional representatives.

STERLING

According to Sterling, three ideas will be stressed in Norge advertising: (1) That the Norge is the best refrigerator in which to store food; (2) that it is priced to fit the pocketbook; (3) that the prospect must see the Norge before she buys another make.

To help dealers make a perfect sales presentation, sales talks for refrigerator, range, washer and ironer have been recorded by the company. The records last four minutes. The salesman demonstrates by pantomime while the story is being told for him.

Hotpoint held meetings for distributors' organizations in Los Angeles, Portland and Salt Lake City. Dealer meetings were then arranged by the distributors.

The group presenting the 1939 line was, as usual, saturated with interesting figures. August Jaeger, manager of the water-heater division, said that in 1938 one water heater was sold to every 4 ranges. D. C. Marble, range division manager, claimed that a third of all electric ranges sold are Hotpoint. George H. Smith, refrigerator division manager, predicted a 25% increase in refrigerator business this year. Harry Warren, manager of the home laundry division, said that 48 manufacturers report washer and ironer sales in the $40 class to be but 8% of the total. Thirty-six per cent of the total, he said, are in the $70 class.

Physically different from, but in a sense similar to these shows was the merchandise mart's market week. Dealers from many parts of the West flocked into San Francisco to inspect and buy the manufacturers' latest offerings. Results were above expectations. Both buying and attendance were better than in previous years.

It was at the radio and appliance trade dinner Feb. 1 that dealers learned most, however. Then Don E. Gilman, NBC vice-president, declared that television has turned the corner and would definitely be started on an experimental basis in New York this spring. But, he said, television will be costly; it will restrict owners of sets to seeing in a darkened room; and because of excessive costs of production and limited area of reception, it will be some time before it is available in many areas. He urged dealers, therefore, to keep on selling audio radio for all that it has to offer in entertainment, education and news.

Howard Blood, president of Norge, appeared for a second time on an appliance-trade dinner program with a message of hope for 1939. Because people are not so afraid of losing their jobs and business men are determined to quit worrying about taxes and labor; because the farm market is relatively good and the obsolescence of appliances is creating a new market, he predicted a banner year. New advertising appeals, more sales training, better looking products and improved engineering design will stimulate buying and make business for dealers, he said.

Greatly improved were the mart's displays. Frigidaire had just moved its Pacific headquarters into the building and enlarged its space. Little Giant washer had put in a display; California Electric Supply Co. had entered Standard electric ranges, and Landers Frary & Clark had enlarged its Universal line exhibit.

Traffic Builders

Postoffice, theater tickets, cash register—all help

It's an old and recognized fact that the more traffic there is through a store the more merchandise is likely to be sold. How to build that traffic is, however, the problem.

W. A. Duncan Electrical & Radio Shop, in the western part of Los Angeles, has developed several answers.

For one, it secured the placement of a U. S. Post Office in the rear of the store. This does not pay in itself, but it pulls in an average of 100 persons daily. Of this number, about 75% are residents in the vicinity, the rest come in from the general traffic. The neighborhood people, of course, come time and time again, so the shop has become a land-mark for them.

Another traffic puller is a little department of greeting cards, also maintained in the rear of the store. This department does its big work during holiday seasons. Still, there is always a number of greeting-card customers each day.

Yet another puller is the company's theater-ticket business. No particular money is made in handling tickets, but the fact that the store does so establishes plenty of contacts.

All the traffic brought in by these devices is subjected to large displays of appliances. This means business.

But it is the store's big cash register which builds even more business. In fact, the 6 sq.ft. surrounding the register have become the most productive in the shop.

During cold weather an electric heater selling for about $7.50 is set up beside the cash register. While a customer is waiting for change, he is bathed in warm air. Result: A good volume of heater sales.

During warmer weather the heater is supplanted by a make-up mirror with indirect lighting. Door chimes, which the customer is usually invited to play by pushing the button, are also within easy reach.

All these merchandising methods have built sales. Today, therefore, the Duncan shop is one of the larger electrical stores in that particular section of the city.

Future Campaigns

The same old story with lots of new angles

Following are the utility-dealer campaigns and special events which have been scheduled for the next several months:

B. C. Electric Railway Co.—March, kitchen-modernization campaign coupled with four-week showing of G-E Magic Kitchen. April, range, water-heater and refrigerator campaigns.

Coast Counties Gas & Electric Co.—March and April, range and water-heater campaigns.

Electric Appliance Society of Northern California—March, introductory promotion for new ironer merchandising plan. April, refrigerator campaign.

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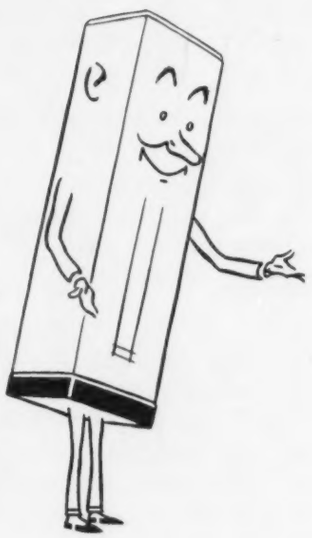
Electrical West

Sales Guide

What's in Water Heaters



for the Salesman—

Electric water heaters may not have looked very attractive. There are no gadgets with which to put on a demonstration. But we asked one salesman who had made a good thing out of water heater sales—and this is what he said:

"Yes, I sell electric water heaters. Tell you why—

1. They make a fine follow-up to the sale of a range.
2. The people already know me, and receive me cordially.
3. They already know the value of electric service. Selling them hot water service is natural.
4. I seldom have any service trouble after the sale is made.
5. The sale is large enough to earn me a better commission on the single sale.
6. Nothing I can sell gives more satisfaction, every hour of the day. It is always a pleasure to make a sale like that. It stays sold.
7. And it helps me make other sales—they give me names of good prospects, and do most of the selling for me.

"Any salesman can do better for himself and the firm by spending a little time learning to sell electric water heaters."

for the Dealer—

No romance, nothing to get excited about—that's often the attitude a dealer takes toward electric water heaters. Why should he sell them?

We asked a successful dealer—this was his answer:

"I sell electric water heaters because—

1. More of the profit from every sale stays with me.
2. There is practically no service cost.
3. The sale stays sold—and the customer likes it.
4. I don't know of anything that gives my customer greater everyday satisfaction.
5. It fixes me up solid with that customer for the sale of other electrical needs.
6. Besides, it rounds out my business, gives me a fine follow-up sale after selling a range.

"It may not be flashy, but it is good substantial business. It takes a little more thought, more preparation. I do have to find out more about my customer's family needs. But that's valuable information to have anyway.

"With a little planning, the selling of water heaters is never hard."

What Electric Water Heaters mean to You

What to Say

Hot water may be hot water, but—

Peace

is what

Make the most of electric water heating's **dependability** and **safety**—to the purchaser these mean freedom from worry on leaving the house or leaving the children at home alone. It also means they can depend upon an ample supply of hot water when they return tired from a trip. These are advantages people are willling to pay extra for—sell them.

True enough, any sort of heat may warm water. To sell **electric** water heating, talk more of the special kind of a job of water heating that electricity alone does. Talk **positively** of these special advantages. No need to knock any other fuel.

If anyone accuses electric water heating of costing more than other kinds, these advantages will make the extra cost, if any, well worth paying. People are willing to pay more for superior service or quality. They do it everyday for other products.

The way to sell electic water heating is to sell **up.** It has all of these special advantages to sell up with.

Peace of mind—whether anyone is home or not, day in and night out, never a care or a worry over the water heater. There is nothing to turn off, remember, or think about. This advantage alone is priceless.

Healthful—Next to Godliness is cleanliness, and dependable hot water service makes it easy to bathe often, wash clothes, clean house, sterilize the dishes, take better care of the complexion. Indispensable in time of sickness.

Clean—the cleanest way to provide hot water. Heating itself produces no soot or dirt. The air remains clean and vital with electricity as the fuel.

Dependable—Hot water instantly at the turn of the faucet night or day. No waiting or

STAMP OF APPROVAL

Recommended by Your

THE MONTANA POWER CO. • UTAH POWER & LIGHT CO.
IDAHO POWER CO. • CALIFORNIA OREGON POWER CO.
ROCKY MOUNTAIN ELECTRICAL LEAGUE

# of Mind

you can sell

tank patting. No pilot to go out. Failure of water or fuel do not bring danger.

Satisfaction of having the best—A social prestige goes with having the best and most up-to-date home equipment. If the handsome heater is installed in the kitchen it is a thing of beauty and utility in modern styling.

Luxury—The luxury only queens knew in ancient days is available to anyone who has electric hot water service. There's a feeling of luxury in not having to wait for hot water to bathe, shave, clean, or when there is sickness in the family.

Modern—Truly tomorrow's way of living—electrically, available today. In modern living there are over 100 uses for hot water and less than 10 for cold water in the home. The investment can be made in an electric water heater with full confidence of abundant fuel supply in the future.

Enhances home value—Heating water under perfect temperature control gives longer life to tank and heater. Electrically equipped homes have higher resale value. Insurance risk is reduced. Hot water helps to maintain other home equipment better.

Efficient use of heat—Immersed in water, the electric element gives all of its heat to the water, none is wasted up the flue. It remains efficient all through its life because it still gives all its heat to the water.

Installed anywhere—Where space is scarce electric water heater can be installed in a closet, under the floor, anywhere without respect to flues or air supply.

After building up with a prospect the advantages to be had by use of an electric water heater the question of cost must be answered satisfactorily. To do this it is necessary to get a clear picture of water heating costs by going into the subject with the electric utility in your territory. It has made a study of the kind of water heater service it can render best, computed special rates, developed wiring arrangements, and reduced everything to simple terms you can well employ in your selling. Take full advantage of this sales help. It will pay you.

to

follow up

ranges with profit

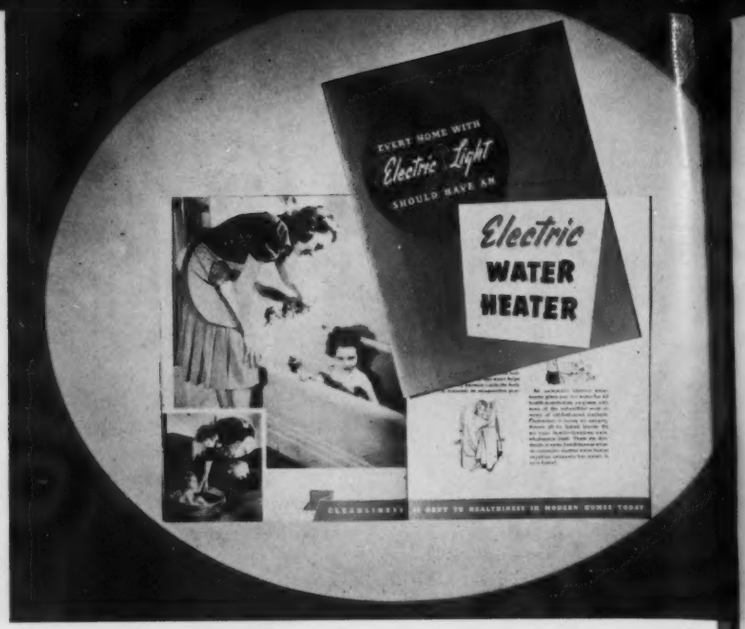
Sell

Electric Water Heaters

Sales Allies —

PUGET SOUND POWER & LIGHT CO.
PORTLAND GENERAL ELECTRIC CO.
WASHINGTON WATER POWER CO.

What to do— — to produce more Water Heater Sales and Profits



Reminders, these. Possibly you do all of them now. If not, they are worth considering as part of your merchandising plan. Might as well make water heaters a paying part of your business. There's no profit in just stocking them. There is in really selling them.

Type of water heater—Find out the type that the local utility recommends. There are special rates and conditions that have been studied out to fit local water conditions, and give best kind of service.

Rates—Get the details of the water heater rate, and some actual cost of operation figures from the utility and from users. These dispel the old "high cost" bugaboo. Prove it isn't so.

Wiring—Check up what arrangements are being made locally through the utility.

Campaigns—They cut into sales resistances — learn when they are to be and ride in the wake to bring home more sales.

Demonstration equipment—To make up for the fact that there is not much to demonstrate in an electric water heater, manufacturers have prepared a number of clever slide films, demonstration kits, cut-away models, etc. If possible, arrange to buy, rent, or use these. They help your customers **visualize** water heating.

Use the National Campaign—

"Every Home With Electric Light Should Have an Electric Water Heater," is the slogan that has been selected for a national campaign on electric water heaters. Backing this slogan will be national advertising, publicity in women's magazines, and a series of local campaigns.

Two fine sales aids are offered to dealers and salesmen by the Modern Kitchen Bureau, 420 Lexington Ave., New York City.

The visual manual, pictured at the top of the page, is 8½ by 11 in., or letter size, it has large full page pictures illustrating the uses and advantages of electric water heating, contrasting with the old way, and straight **advantage** messages that permit its use with any make you handle. Use it directly in talking with prospects.

Double-purpose is the smaller 5 by 8 in. size selling booklet. Illustrated with cartoons and a snappy "check up" of electric water heater advantages, it can be used either by the salesman to check up on his own sales presentation or by the prospect to read and check up on water heating herself.

Each of the advantages of electric water heating—"convenient, automatic, clean, safe, dependable, modern, low cost," is explained by the water heater itself in this booklet.

—and How

Idaho Power Co.—March and April, range campaign.

Montana Power Co.—March, home laundry campaign. April, range campaign.

Nevada-California Electric Corp.—March and April, range campaign.

New Mexico Public Utilities Corp.—March and April, adequate-wiring campaign.

Portland General Electric Co.—March, water heater campaign. April, range and water-heater campaign.

Public Service Co. of Colorado, Denver—March and April, campaigns on laundry equipment, IES lamps, refrigeration, commercial lighting, adequate wiring and high-wattage lamp bulbs. Grand Junction, Colo.—March and April, range and water heater campaigns.

Puget Sound Power & Light Co.—The company's running-water campaign this year will be a departure from previous campaigns. Formerly outdoor demonstrations of equipment were held. This year an open house will be held at different dealers' stores. Farm customers will be invited for a program illustrating the benefits to be derived from running-water equipment. A window-display contest is calculated to stimulate this form of advertising.

Sheridan County (Wyo.) Electric Co.—April, range and roaster campaigns, with special store exhibits.

Southern Colorado Power Co.—March and April, campaigns on irons, ranges, refrigerators and water heaters.

Southwestern Public Service Co., Carlsbad, N. M.—March, kitchen-fixtures campaign. Roswell, N. M.—March and April, light-conditioning campaign.

San Diego Bureau of Radio & Electrical Appliances—March, washer and ironer campaign. April, refrigeration compaign.

Trinidad (Colo.) Electric Transmission, Railway & Gas Co.—March, refrigeration campaign. April, modern-kitchen campaign. A special exposition will be held on modern kitchens, plumbing, building and furniture.

Utah Power & Light Co.—March, campaigns on cooking, water heaters, table cookery and washers. April, campaigns on refrigerators, cooking, water heating, table cookery and vacuum cleaners.

Western Colorado Power Co.—March, campaigns on brooders and range unit replacements. April, campaigns on brooders, ranges and water heaters.

Formula

Local market opportunities best arouse dealers' interest

Here's a formula for arousing dealers' interest: Bring them—as did Valley Electrical Supply Co., merchandising division of San Joaquin Power—a story of their market opportunities in terms of their own town and trading area.

In the past, Valley Electrical presented only general market figures based on the entire system. This year, however, it broke down the market possibilities in each local area and presented them with all the drama possible.

Five meetings were held throughout the company's territory. Each was a combination session for pump dealers, appliance dealers and wiring contractors and inspectors.

To dramatize the local nature of each meeting, a colored map of the area under immediate consideration was used. Each of the eight speakers presented a chart showing the specific market under the classification of which he spoke. As they finished, they hung their chart on a wire at the rear of the stage. E. G. Stahl, general commercial manager, then closed the meeting with a summary of the meaning of the charts and a re-emphasis of the income to be expected from the area in dollars and in equipment units.

Not in a long time has the interest of the dealers been so great. Basing its belief on the audiences' rapt attention, Valley Electrical expects to see every dealer make a doubly strong effort to obtain a larger share of his local market in 1939.

APPLIANCE SALES REPORT, 1939

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

REPORTING COMPANIES	Idaho Power Co.[1]		L. A. Bureau of P. & Lt.[2]		Montana Power Co.[3]		P. G. & E. Co.[4]		San Diego Cons. G. & E. Corp.[5]		San Joaquin Lt. & P. Corp.[6]		Southern Calif. Edison Co., Ltd.[7]		Utah Power & Lt. Co.[8]		Wash. Water Power Co.[9]	
	Current	1 Mo.	†Current	†Mo.	Current	1 Mo.	*Current	*12Mos.	Current	1 Mo.	Current	1 Mo.	†Current	†1 Mo.	Current	1 Mo.	†Current	†12Mos
Ranges	101	101			59	59	331	4,053	20	20	102	102			281	281	140	2,256
Water Heaters	35	35			8	8	253	2,635	25	25	73	73			14	14	58	1,591
Air Heaters, aux.	51	51					2,228	7,727	300	300	66	66			149	149	378	1,305
Air Heaters, 220					29	29	152	1,034			80	80						
Refrigerators	91	91			249	249	2,211	40,141	350	350	171	171			652	652	251	6,506
Dishwashers	1	1					8	204			1	1			1	1	2	10
Washers	407	407			415	415	2,761	29,634	350	350	218	218			510	510	348	5,087
Ironers	58	58			51	51	743	5,938	50	50	31	31			74	74	41	374
Vacuum Cleaners	113	113			167	167	3,141	25,419	275	275	113	113			328	328	257	2,490
Radios	808	808			1,485	1,485	23,800	124,749	950	950	525	525			3,135	3,135	3,036	16,659
Mixers	61	61					1,251	5,002	75	75	71	71			341	341	916	2,549
Cookers, Casseroles	15	15							40	40	32	32			93	93	655	5,285
Irons	335	335							375	375	273	273			1,316	1,316	1,316	9,148
Waffle Irons	107	107							100	100	149	149			753	753	702	2,800
Toasters	182	182							200	200	177	177			699	699	1,682	6,170
Table Stoves	127	127			968	968			75	75	89	89			1,794	1,794	327	1,989
Heating Pads	123	123							225	225	98	98			318	318	419	1,724
Curling Irons															132	132		
Coffee Makers	144	144							225	225	234	234			739	739	1,729	6,738
Sewing Machines	10	10					641	5,725	100	100					144	144	40	712
Clocks	133	133							250	250	241	241			499	499	1,024	3,833
Fans	10	10									1	1			12	12	61	3,077
Floor Polishers																		
Sun Lamps	23	23													9	9	29	97
Reflector Lamps	232	232									163	163			1,097	1,097	2,251	11,656
Miscellaneous Lamps	384	384			1,231	1,231									479	479	2,331	13,764
Yard Lights											36	36			72	72		
Misc. Small Appl.									600	600	184	184						

SOURCES

[1] Figures compiled by Electric Equipment Sales Association. Include power company sales of all reporting dealers.

[2] Compiled by Los Angeles Bureau of Power and Light for territory served by that system.

[3] Combined dealer and company sales from report of Montana Power Co. ‡ Does not include dealer figures for two divisions for January and February, 1938.

[4] P. G. & E. reports sales of major appliances only based on accurate reports from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. *Due to delays in compiling report current and total figures are always one month behind those figures of companies reported in other columns of this table.

[5] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Miscellaneous figures includes fans, curling irons and sun lamps.

[6] Includes dealer reports from Midland Counties Public Service Corporation also. Compiled by Valley Electrical Supply Company.

[7] Includes reports from dealers on San Joaqin Valley system of company as well as Southern California areas served.

[8] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.

[9] Dealer sales only for Spokane and company territory. Company sales not included. Table stoves, grills included with cookers.

† January figures were not available at time of going to press.

ELECTRICAL WEST

The All-Industry Magazine of Progress

Established 1887 and Incorporating the "Electrical Journal," "Journal of Electricity, Power & Gas" and "Journal of Electricity"

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To the Right

CLOSE observers of the Washington political scene are expressing firm convictions that the swing of national government is definitely to the right. If such is the case, then there is real cause for jubilation on the part of the light and power industry and those related industries whose prosperity is closely allied with its progress. No single industry has suffered more, both from actual and potential governmental hostility, than have the utilities. The confidence of their stockholders has been shaken; the enthusiasm of investors for their securities destroyed. A psychology of fear has permeated throughout the industry which affected morale and retarded progress.

There are facts to support the belief that skies are clearing, and contradictions which seemingly indicate that the federal power policy is a matter of whim and fancy. Of tremendous importance was the settlement between TVA and the Tennessee Electric Power Company on what constituted a fair and just price for that utility's properties. If the final price of $80,000,000—$20,000,000 more than the original offer—means the end of highjacking with the threat of subsidized competition, then it is a good sign. Yet it is difficult to reconcile this favorable development with the knockdown price paid a few days later for the properties of Memphis Power and Light Company.

The President also has announced that utilities had no cause to fear new federal power developments; none was contemplated. Yet on the same day the Senate restored a $12,000,000 appropriation for the Gilbertsville Dam in the TVA after the House had refused it. And the Administration has revived the fantastic Passamaquoddy scheme.

On the favorable side, Harry Hopkins, in his new position as Secretary of Commerce, is reported to be planning a definitely conciliatory and cooperative program between business and government in which the utilities are to play a prominent role. He is convinced that fear and hostility must vanish if recovery is to be speeded. Reputedly, additional PWA loans and grants for new public ownership plants will be few and far between.

All of which leaves too much room for speculation. The electrical industry would like to see an end to the six years of warfare with the Administration. It would like to see a definite, clear-cut statement of government power policy. It would like to see curbs placed upon the Administration's power zealots who preach cooperation and fairness on the one hand and practice exactly the opposite on the other. It would like to see an end to so-called reforms induced by the goad and whip of political demagogy and a pause during which the reforms of the last few years can be digested, modified or repealed.

Finally the electrical industry would like to go to work—building, selling, developing and promoting new electrical uses and applications. Only in this way can it devote its full effort to building a real and lasting business recovery. Yes, the industry would welcome a swing to the right.

From Barbers to Bankers

EVERY business in the electrical industry has contacts with the public every day. No matter how large or how small the company, its position in the community is determined by what the public reads, sees, hears or feels about it. If its relations with its employees, its customers, its stockholders, its suppliers and its community are sound and are understood, then the general public will secure a good impression of its policies and purposes through the grapevine which is firmly rooted in every community. Likewise, if any of these relationships are bad, then the grapevine will see that the public knows about it.

How can this community grapevine be nurtured and cultivated to assist in forming good public relations? The experience of one highly successful industrial organization demonstrates a method. In addition to the normal good citizenship activities in which it participates in the communities where it operates, it has adopted a supplementary means.

The company recognizes and deliberately cul-

tivates those business and professional people in its communities who are a force in molding public opinion. It maintains a mailing list to which it sends explanations of policies and purposes. These range from its "constitution"—a declaration of basic company policy and pledge of consistent fair and honest dealings with employees and public—to periodic statements by its chief executive and directors. These mailings may be a reprint from the current employees' paper, a simple and clear explanation of its annual report or a statement of policy revision.

The mailing list itself is interesting. Included are the names of bankers, doctors, dentists and lawyers; bakers, barbers, restaurant owners and merchants; Protestant preachers and Catholic priests; operators of bowling alleys and the principals of schools; public officials and industrial executives. No member of the community who might influence public opinion in the mass is overlooked.

Naturally this company's acts and policies merit the support of these groups. If they did not, the plan would be meaningless. But because they are right, the program succeeds in building ever stronger public relations. Doesn't this open up new vistas for public relations activities in the electrical industry?

World's Fair

TREASURE ISLAND in San Francisco bay opened its turnstiles to the public on schedule February 18. Thus began a run of the West's World's Fair, the biggest show on the Pacific Coast this year. Within the first week half a million people had already passed through its gates. The show is a success from the start.

Within a month the remaining uncompleted buildings and exhibits will be finished. Smooth operation of all others will have been perfected. By April the Fair will be a going concern in every aspect.

Just as in the case of the bridges it commemorates, there were plenty of doubting Thomases. There always are. Then there are others who want to see if it is a winning horse before becoming enthusiastic or putting any money into it. Success of the opening has already brought in a number of fence sitters, asking for space to exhibit. It ought to bring in many of the remaining who should have been in from the beginning. It is foolish not to exhibit in a show window before which ten million persons will pass.

Thanks to the faith of James B. Black, A. Emory Wishon and a score of San Francisco electrical men who refused to be downed by indifference, skepticism or fear, both the Fair and the Palace of Electricity are a success. Their faith had much to do with making electricity the dominant attribute of the fair. Its lighting at night is more beautiful than even the most visionary had hoped. The use of electricity in giving life and color to the exhibits is almost universal.

Thus to the electrical man visiting from anywhere the Golden Gate International Exposition in San Francisco is a comprehensive example of electricity at work in all varieties of ways, a laboratory of new and interesting lighting techniques, a place where he may observe experiments in lighting and see whether or not they satisfy the purpose.

This point of view is recommended for a full enjoyment of the Fair, and so that the highest potential business and professional value may be taken home from it. The exhibits are concentrated. Close examination of them will repay in revelation of unexpected interests and valuable information. Artists have called Treasure Island a jewel of beauty. As with a jewel, highest enjoyment comes from close inspection of its fineness and quality.

Facsimile, Bright and Dark

FOR central station men, who must always build with one eye focused far into the future, facsimile radio offers a fascinating field for conjecture. It can be little more than that, at present, for as yet there is no telling just how it will get along with such buddies as radio, television and the daily press—none of which is likely to relinquish any headway it may have made toward capturing the public eye or ear.

On its brighter side, facsimile radio holds forth the prospect of an ideal off-peak load. Facsimile newspapers are printed in the early morning hours, sets being operated by time control. One receiver draws around 85 watts. If one out of ten domestic and farm customers in the West were to buy a facsimile receiver, there'd be a new, midnight-to-5-a.m. load, equivalent to more than a million dollars in revenue every year, which could be served with no additional facilities. And there'd be another $300,000 annually in the 4-watt time controls, which, incidentally, would be operating at 100-per-cent load factor.

On the darker side looms the horror of a service interruption between midnight and 5 a.m. There'd be real hell to pay if the subscribers should rush to their radios, tear off their morning papers and then discover that George Bungle had lost his head, that Donald Duck had lost his quack, or that Mandrake the Magician had actually turned invisible.

Somehow though, we don't feel that's going to be much of a bugaboo to the Western systems. Without going into any extensive research, we can report on our own electric clock. It's the kind that stops and stays stopped if the juice goes off. This clock has been running continuously now for 1,082 days, and the only thing that's holding down its record is that it has only been installed that long.

NEWS OF THE INDUSTRY

CALIFORNIA SEEKS TO OPERATE CENTRAL VALLEY PROJECT

California's participation in the Central Valley project should be increased, Governor Culbert L. Olson told Secretary of Interior Harold Ickes last month.

The governor recommended that the California Water Authority enter into a contract with the federal government whereby the authority would assume operation of the Central Valley project upon completion and would repay the reimbursable cost of the project in accordance with the reclamation law.

If the contract is made, the state would also build a steam generating plant at Antioch with necessary transmission and distribution facilities. The plant would be financed through issuance of revenue bonds by the water authority and a loan and grant of PWA funds.

WAR-TIME EMERGENCY REPORT READY SOON

WASHINGTON *(McGraw-Hill Bureau)* —Report of the National Power Policy Committee showing the need of additional generating capacity to meet wartime emergency of industry is expected to be sent to President Roosevelt within the next month or so.

A highly interesting feature of the report, data for which are being carefully studied at present, will be a map showing recommended inter-connections between utilities so that in case power plants or lines are destroyed in one area the utilities in adjoining areas can supply power to the stricken communities.

It is expected that these interconnections will also serve to strengthen present networks and can be included as part of the base rate. Inclusion of such properties would eliminate utilities' objections that they would be called on to make capital expenditures on which no return could be expected.

RATE REDUCTIONS representing a $200,000-a-year saving to Pacific Power & Light commercial and residential customers in Washington and Oregon went into effect March 1. Oregon customers will save about $110,000, while the rest of the reduction goes to Washington communities served by the company. Average reduction in residential service is 8%. Commercial customers will save from 9 to 20%.

JUST ONE, MR. JONES?

"I don't want electric lights," a Walla Walla, Wash., citizen explained when he recently made a meter deposit with Pacific Power & Light Co. "I'm just tired of bothering with storage batteries for my radio. I want 'juice' for an all-electric set."

Undaunted, Pacific Power dispatched a service man who did as ordered—installed just one plug-in receptacle for a radio.

CENTRAL ARIZONA TO GET BOULDER, PARKER POWER

Secretary of Interior Harold Ickes last month agreed tentatively to supply power from Boulder and Parker Dams to central Arizona, where a critical power shortage is expected to develop this year because of a water shortage.

Under the agreement, reached with Central Arizona Light & Power Co. and the Salt River Valley Water Users' Assn., the Bureau of Reclamation would construct a transmission line from Parker Dam to Phoenix and would complete the power house at Parker and install three 30,000-kva. generators there.

Estimated cost of this development is $9,456,000—$7,831,000 for the Parker power plant; $1,300,000 for the Parker-Phoenix transmission line, and $325,000 for the Phoenix terminal substation. Already, $1,000,000 of this total have been expended on construction of the forebay and power house substructure.

Until the Parker installation was completed, central Arizona's needed power would be supplied from Boulder over the Metropolitan Water District's line connecting Boulder with Parker.

Ickes said the threatened power shortage arose because of small stream runoffs in central Arizona and an extended drought in that region.

As their share of the Parker development, the power company and water users' association have announced themselves as ready to guarantee a minimum annual payment of $220,000 a piece.

BILL TO REPEAL a state law which prevents power companies, and especially rural electrification projects, from competing with established utilities in communities of 10,000 population or less was approved last month by the New Mexico State Senate by a 19 to 4 vote.

PUD'S RESERVE 215,542 KW. OF BONNEVILLE POWER

Public utility districts and municipalities of Oregon and Washington have reserved 215,542 kw. of Bonneville power for their use by the end of 1940, the Bonneville Administration disclosed last month.

The announcement was the most important—and obscure—bit of public utility district news in a month replete with news: That West Coast Power Co. and Willapa Electric Co. have agreed to sell their properties to the Pacific and Wakiakum Counties PUD's for $609,000. That Oregon and Washington legislatures were drafting bills for amendment of their respective PUD laws. That two established PUD's have applied for Bonneville power.

Who exactly would get the 215,542 kw. of Bonneville power was not made known. On being approached for a breakdown of the power reservations of each utility district and municipality included in the total, the Bonneville Administration stated that the details were not available now, since they were being held confidential by the House Sub-Committee on Interior Department Appropriations at Washington, D. C.

Second most important bit of news was the plan to buy the two utilities in Washington. According to Jack Cluck, counsel for the PUD's, sale of the companies is contingent upon the ability of the districts to sell revenue bonds, payable solely from earnings, yielding 4½% interest per year. The deals are to be completed by April 1.

Pacific County PUD would buy Willapa Electric properties for $189,000 and West Coast Power properties for $300,000. Wakiakum County PUD would buy West Coast properties for $120,000. All distribution facilities and power plants are included.

Meanwhile, goaded by state grange leaders, Oregon and Washington legislators were considering changes in PUD laws. In neither state had these bills reached the floor of the legislature by the middle of the month.

In Oregon, the intent of the proposed law is to repeal the old law, make it easier to form districts and legalize the issuance of revenue bonds. Sponsors were having difficulty in agreeing on details so that the measure could be passed.

In Washington, two measures were under consideration: One calling for the creation of a Washington Utility

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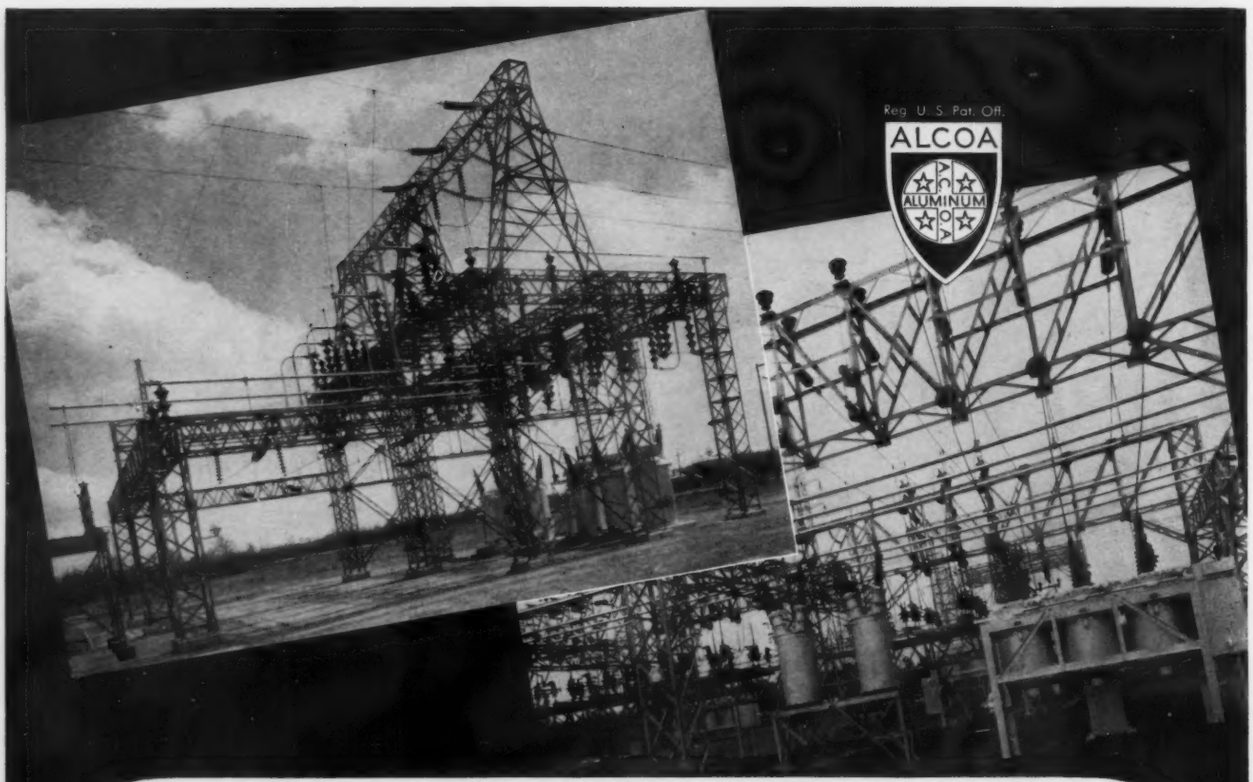
Install G-E Home Wiring* in every home you wire. You will be doing a favor for your customers and yourself. Your customers will obtain truly adequate wiring. You will obtain larger wiring jobs. The use of G-E wiring materials enhances your reputation for dependable work because G-E materials give lasting, satisfactory service. For a G-E Home Wiring* manual and for further information on G-E wiring materials see the nearest G-E Merchandise Distributor or write to Section CDW-973, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC



Tubular Alcoa Aluminum Bus Bar

SIMPLIFIES THE CONSTRUCTION OF OUTDOOR STATIONS

Light in weight, Aluminum bus bar places less burden on supports. They can be few and widely spaced, and the structure itself can be lighter in weight, thereby effecting many economies in materials and labor.

Standard construction methods and simple, inexpensive fittings are used with Alcoa Aluminum bus bar, whether tubular, flats, channels or angles. Installations are attractive. They stay that way, because Aluminum weathers well and stands up under corrosive conditions encountered in most manufacturing processes.

Alcoa Aluminum bus bar offers a high degree of thermal, electrical and mechanical efficiency. Ask our engineers to assist you in selecting the material which best meets your needs. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh, Pennsylvania.

Bonneville Reservations

WASHINGTON *(McGraw-Hill Bureau)*—Although Bonneville Administrator J. D. Ross' testimony before the House Appropriations Committee was not released last month, reliable authorities declare that the list of PUD's and cities said to have reserved 215,542 kw. of Bonneville power is substantially the same as was given by Ross in last year's testimony.

At that time the potential customers were not formally listed: counties were merely mentioned one by one by Ross. Although the resultant total—245,700 kw.—is slightly higher than that announced this year, Ross' list, as follows, gives some idea of what districts and cities are seeking Bonneville power.

WASHINGTON	
Mason County	12,000 kw.
Lewis County	3,500 "
Pacific County	2,200 "
Cowlitz County	51,000 "
Wahkiakim County	300 "
Skagit County	25,000 "
Whatcom County	16,000 "
Snohomish County	46,000 "
Kittitas County	7,000 "
Chelan County	30,000 "
Okanogan County	15,000 "
Douglas County	5,000 "
Lincoln County	5,000 "
Franklin County	2,000 "
Benton County	3,000 "
Pend Oreille Co.	2,400 "
Snohomish County	2,600 "
Stevens County	2,200 "
OREGON	
Cascade Locks	500 "
Tillamook PUD	4,000 "
Wickiup PUD	1,000 "
REA projects in three states	10,000 "
TOTAL	245,700 "

District Authority, composed of a member from each county district. This super-district would have charge of generating and transmitting electrical energy. The second bill would authorize special elections to vote on public utility districts.

First area in Washington to contract for Bonneville power was Klickitat County's newly formed utility district. It filed application for 1,000 kw. of prime power and a like amount of secondary power. Service would be required by Oct. 1, 1939.

The Tillamook County district, the only major PUD in Oregon, asked the Bonneville administration to reserve 3,600 kw.-yr. of energy and to construct a line into the area, now served by Mountain States Power Co.

Other scattered public ownership news concerned the obtaining of local power facilities by the City of Grand Coulee Dam, Wash., and the City of Ventura, Calif. In both places, the city councils appointed commissions to study the possibility of municipal ownership.

Plain Hoss Sense
+ good basic quality
+ up-to-date design
= SUPERIOR
REG. U. S. PAT. OFF.
★ ★ PRODUCTS
THE SUPERIOR SWITCHBOARD & DEVICES CO.
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METER & RELAY TEST SWITCHES
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Better LIGHT... better SIGHT... for SCHOOLS

Smart contractors everywhere are raising the standards of lighting in schools . . . and reaping the benefits of profitable Wiremold re-wiring jobs.

Wiremold gives you the ideal wiring method for such work . . . adaptable to every requirement . . . requiring no costly structural changes . . . neat, unobstrusive and efficient in results. And remember, Wiremold products, methods and cooperation give the contractor every advantage in selling, installation . . . and profits.

HERE'S REAL *SELLING* HELP FOR YOU

Wiremold data sheets are available showing typical school lighting improvement jobs. They're yours for the asking . . . also Wiremold Engineering service on your own particular jobs. Write us today.

ADEQUATE WIRING SERVES AND SAVES

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New Rate Schedule Goes Into Effect in Eugene

Eugene (Ore.) Water Board last month put into effect a new rate schedule which provides 100 kw.-hr. of electricity for $2.12 per month, 250 kw.-hr. for $3.92 per month and 375 kw.-hr. for $7.16 per month.

Since "the new schedule undoubtedly will result in a greatly increased use of electricity," J. W. McArthur, Eugene superintendent, revealed the city is negotiating with Administrator J. D. Ross for a large block of Bonneville power to insure sufficient electricity to meet local demands.

Construction of a transmission line from Bonneville to Eugene, 160 mi. away, is already being speeded.

Residential schedule available to Eugene homes is: First 15 kw.-hr. at 4c per kw.-hr.; next 25 kw.-hr. at 2c; next 60 at 1.7c; all over 100 at 1.2c. Minimum charge is 60c per month.

●

EL PASO CITY council and El Paso Electric Co. last month signed an agreement providing for an immediate commercial rate reduction of $34,156 a year and a residential rate reduction of $53,400. The contract also provided that whenever the city decides to go into the power business the company's contract to purchase Elephant Butte power from the Bureau of Reclamation will be cancelled and the city permitted to receive the power.

●

CUSTOMERS of Mt. Hood Electric Co., which has been bought by Portland General Electric Co. for $33,000, will soon receive the benefit of rate reductions, the FPC announced Jan. 20 in approving the sale. Electric service will also be extended to additional residents in Clackamas County, Ore., and adjacent territory.

●

PUBLIC SERVICE CO. OF COLORADO and the City of Denver were last month negotiating a general rate reduction which would apply to both residential and commercial consumers. Asked by the city was a cut amounting to more than $1,000,000 in Denver's total annual electric bill of approximately $7,500,000.

●

SAN JOAQUIN POWER has been ordered to pay Southern California Edison Co. approximately $530,338 as its share of the annual charges for interest, maintenance and depreciation on the Edison company's storage reservoirs and other headwater improvements on the San Joaquin River. Headwater benefits covering a period of 14 years furnished the basis for the FPC's decision.

WASHINGTON *(McGraw-Hill Bureau)*—Although dodging the moot question of TVA's constitutionality, the Supreme Court's action dismissing the private utilities' bill gives TVA a green light so far as most of its legal difficulties are concerned and establishes a basis for any future ruling on other Federal power projects. In effect the majority opinion held that the privately owned utilities had no right to contest the constitutionality of TVA because none of them, under its charters or franchises, is granted a monopoly. The damage they were able to show, therefore, arose only from competition at lower rates. This might have come from a privately owned competitor.

●

Commission Appointed to Run B. C. Utilities Act

With the appointment of a three-man commission which will serve for the next ten years, the British Columbia government last month placed in operation the new Public Utilities Act to regulate utilities in the province.

Named to the commission were Dr. W. A. Carrothers, commissioner of the Fuel Control Board; Lewis W. Patmore, prominent Liberal and barrister of Prince Rupert, and Maj. J. C. MacDonald, comptroller of water rights.

The commission has far-reaching powers over domestic waterworks systems, bus and motor services, toll bridges, railways, telephone companies and 54 power companies. Municipally owned utilities do not fall within terms of the act unless they are serving outside the bounds of their municipality.

The act provides that, once a utility has secured permission to operate, it cannot abandon service without the commission's permission nor can it charge discriminatory rates. All utilities must obey the orders of the commission, furnish all desired information and keep records as instructed. Certificates of public convenience and existence of the necessity for new construction must be secured and proved before franchises are approved by the commission.

Specifically, the commission has power to cancel any franchise, fix schedules of rates, appraise utility property, approve stock and bond issues before they are issued, control disposal of assets and mergers of utilities, determine standards of service, conduct inquiries into utilities' business, provide for joint use of public utility systems and equipment where necessary, provide for cooperation in the construction of transmission lines, compel power companies to supply power to any building within 100 yd. of any supply wire or cable suitable for that purpose or order extension of power company services beyond this 100-yd. limit, order utilities to keep a depreciation account, to fix the rates of depreciation and to set up a reserve fund.

The commission may enforce its order either by force or by taking possession of any public utility, whose affairs it may manage until the order has been enforced. Appeals from the commission will be on points of law only, and judgments of the commission will come before the appeal court on the same basis as an appeal from a decision of the Supreme Court.

●

$39,983,000 Recommended For Six Western Projects

A sub-committee of the House Appropriations Committee last month began study of the appropriations recommended by the Budget Bureau for the Western construction projects of the Bureau of Reclamation. Of the $49,649,000 carried in the budget for the 1940 fiscal year, $39,983,000 were scheduled for six power projects.

Amounts to be allotted out of the Reclamation fund were: For the Colorado-Big Thompson project, $1,500,000; for the Kendrick project, Wyo., $1,000,000, and for the Rio Grande project, Elephant Butte Power, N. M., $483,000.

The Boulder Canyon project was slated for $4,000,000 out of the general fund; the Central Valley project, $10,000,000, and the Columbia Basin, Grand Coulee project, $23,000,000.

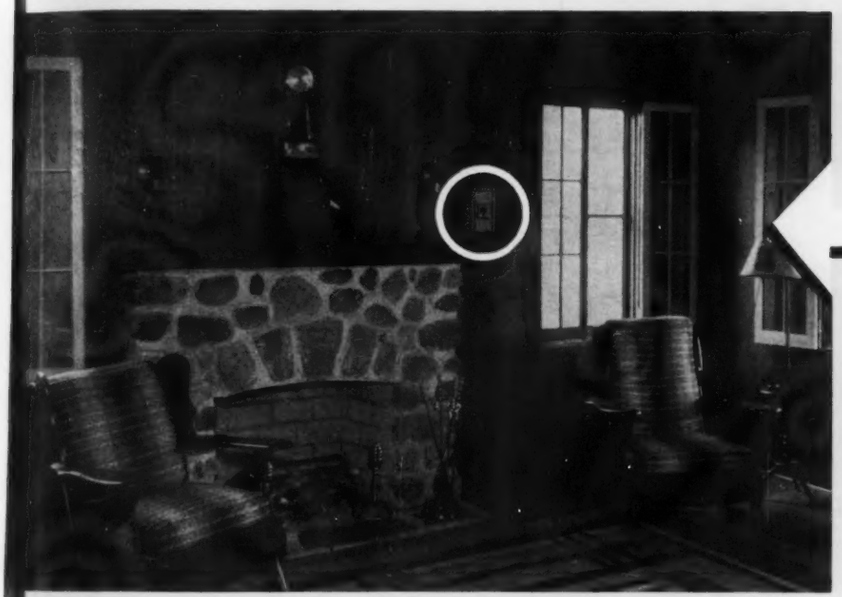
●

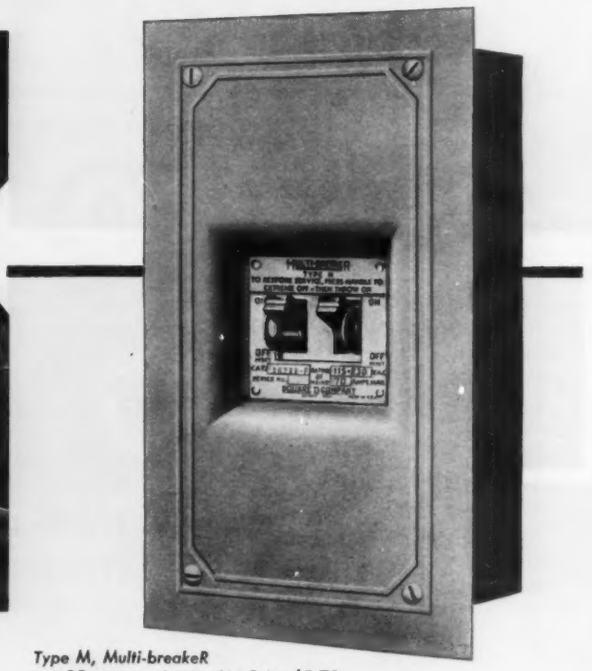
WASHINGTON *(McGraw-Hill Bureau)*—
—A plea that the U. S. Supreme Court reconsider the traditional "fair value" basis for public utility rates enunciated in 1898 in the *Smyth* v. *Ames* decision was filed last month by the Department of Justice in a friend-of-the-court brief signed by Solicitor General Robert H. Jackson, Assistant Attorney General Thurman Arnold and legal officials of the FPC and the FCC. The fair-value rule, which directs that consideration be given to original cost, improvements, market value of securities, reproduction cost and probable earnings under the proposed rate schedules, is attacked as being "unsound in principle" and producing results that are "unreliable, arbitrary and absurd."

●

TIME FOR filing briefs in connection with Pacific Gas and Electric Co.'s application for a preliminary permit for six hydroelectric developments on the North Fork of the Feather River, Calif., has been extended to May 1 by the Federal Power Commission.

EVEN FOR THE LOW COST BUNGALOW ...A SQUARE D MULTI-BREAKER





Type M, Multi-breakeR
two 15 ampere circuits. List Price $5.70

A live-wire electrical contractor got this job of seventy bungalows—with the Square D, type M, Multi-breakeR. Speculative builders know values. They are quick to recognize and adopt improvements which help sell their houses. Read what this realtor has to say about Square D Multi-breakeRs.

"Since our electrical contractor introduced us to the Square D Multi-breakeR, we have become a booster. The first few installations convinced us of its merit as a sales feature. Simplicity of operation and convenience are appreciated by prospective buyers of lake bungalows, far from the general store.

"Most of our bungalows are two circuit, and we use the type M Multi-breakeR which costs just a little more than fusible equipment. This money is well spent. The photograph shows a typical installation of which we have over 70 to date."

Thousands of low cost homes are being built by speculative builders. You can get a lot of these jobs by showing the advantages of the Square D Multi-breakeR. Figure both ways—Square D fusible equipment and Multi-breakeRs. You'll be surprised—and so will the realtors—how little more this modern protection and convenience costs.

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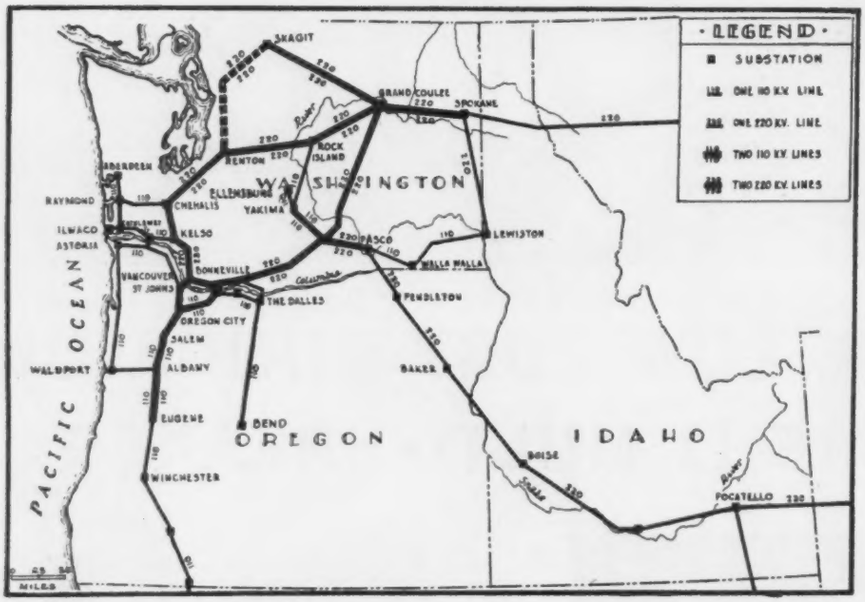
SQUARE D MAN



Ross' master plan contemplates lines throughout Northwest

New Power Developments Planned For B. C.

British Columbia engineers were working last month on plans and surveys which, if they mean anything, will herald a tremendous expansion of the province's power developments.

Largest plan calls for the creation of three new industrial centers and the development of more than 4,000,000 hp. By damming rivers and lakes in northern British Columbia West of the Rocky Mountains, engineers hope to divert waters running roughly eastward into the West coast's deepest harbors, Dean Channel and Bute Inlet, where 1,000,000-hp. power plants would be located.

Most controversial point in the scheme is the damming of the Fraser River at three points. Fishermen oppose this idea on the ground the salmon run would be killed. Engineers state, however, that the dams would have a minimum potential value of $10,000,000, while the salmon industry yields only $3,000,000.

Defense of the coast in case of invasion is probably the most important factor in the scheme. Engineers point out that power plants at Dean Channel and Bute Inlet would be protected from attack by water or land. At the same time, they would be available for the smelting of the huge iron deposits nearby.

Another power development program is being contemplated by Northern B. C. Power Co. It calls for an expenditure of about $750,000 on a new 10,000-hp. power plant at Shawatlans Lake and on the raising of the Woodworth Lake Dam. Whether the program will be undertaken rests, however, upon possible new industrial development at Prince Rupert.

Yet another project is that under consideration by B. C. Electric Railway. The company may shortly spend about $1,000,000 on the construction of a 10,000-hp. steam plant at Brentwood Bay. This plant would be an addition to the auxiliary steam plant now maintained as a standby for the southern Vancouver Island system.

●

FPC Opens Two Radio Frequencies To Utilities

Federal Communications Commission last month granted Southern California Edison Co.'s request for extra radio frequencies for special emergency services when it opened to all public utilities two new frequencies in addition to the 2,726 kc. now in use.

On the basis of testimony before the FCC it was found that the present frequency is subject to considerable limitation when used during the day, and does not provide reliable service over the Edison company's entire system. The utility showed that emergencies which disrupt power facilities and telephone lines also affect all emergency organizations which share the special emergency frequency.

The two new frequencies opened are of 2,292 and 4,637.5 kc. They are for exclusive use by all utilities.

●

ESTES PARK, Colo., will be the scene of the Rocky Mountain Electrical League's 1939 convention. No date has been set, but the meeting will come in September, probably right after Labor Day.

Master Power Plan For Northwest Announced

A "master plan" to bring Columbia River power to practically every Northwest community was disclosed Jan. 20 by Administrator J. D. Ross.

The proposed network would extend down the Willamette Valley to the California boundary. One 220,000-volt line would run eastward through Spokane, and another circuit would pass through Walla Walla and Lewiston, Wash. A similar line through Baker, Ore., Boise and Pocatello, Ida., would reach the phosphate fields of southern Idaho and would tie in reclamation and power projects to be developed on the Snake and Columbia Rivers.

In addition to the initial lines already under construction, it is proposed to transmit power at 110,000 volts to serve the coast districts from Astoria to Waldport, Ore., the central Oregon area to Bend and the region around Pendleton.

High-tension circuits would link Pasco, Yakima and Ellensburg, Wash., with the 220,000-volt transmission system connecting Grand Coulee with Bonneville. The master plan (see cut) would make up a network from which lower voltage lines (66,000 volts and less) would radiate to surrounding districts.

Ross said the Bonneville project would be ready to send its projected 504,000 kw. into such a system by 1945.

●

WASHINGTON WATER POWER CO. has organized an Okanogan division crew to rebuild the distribution system in Omak and the 13,000-volt line between Okanogan and Omak.

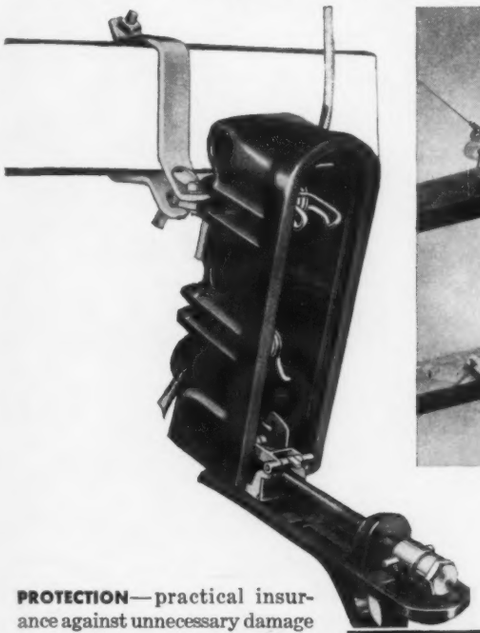
●

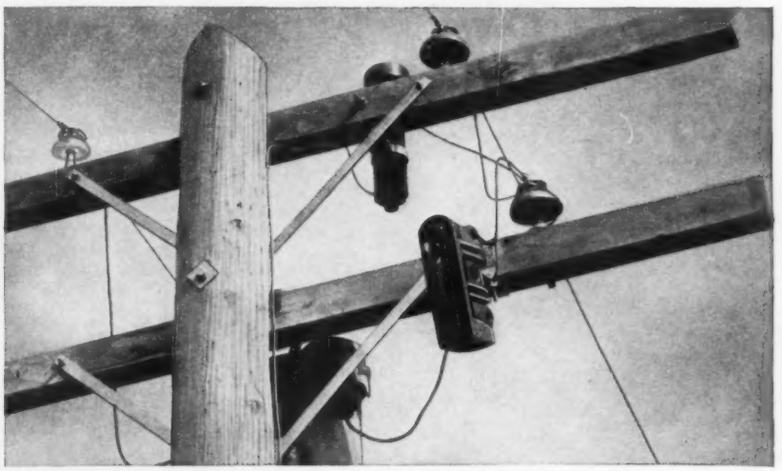
COLUMBIA-VANDERHOOF POWER CO. has been incorporated at Victoria, B. C., as a general light and power generating and distributing business at Vanderhoof, B. C.

Cold Versus Cold

Daily, people are finding new and bizarre uses for electric refrigerators. Ray Lynch has discovered one of the most unusual. Recently Lynch arrived at his lunch counter in Cranbrook, B. C., to find the interior temperature 27 deg. below zero. He noticed the temperature of his big refrigerator was about 20 deg. higher, however. So he opened the door and left the refrigerator to take away the "first nip."

YOU DO NEAT JOBS—FASTER *and* MORE EFFICIENTLY WITH—





KEARNEY PRODUCTS

PROTECTION—practical insurance against unnecessary damage to your equipment is what you have when you install Kearney Trip-O-Matic Cutouts on your lines... and as this cutout protects, it gives visual indication of the outage—the door trips out.

CONNECTION—quickly, safely and conveniently made with genuine Kearney Solderless Wire Con-Nec-Tites that have the patented full round washer to provide maximum strength and conductivity.

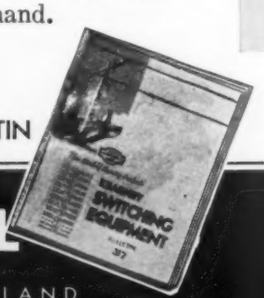
GOOD GROUND—positive grounds that won't loosen under expansion, contraction, or vibration—to cause trouble—are easily made, even over battered rod heads, with modern, wrap-strap design Ground Clamp-Tites.

SECURE LINES—lines today are securely held, without damage to cable insulation, by means of Kearney Dead End Service Clamps that incorporate Clamp-Snub design to safely and positively carry their cable weights.

YOU REDUCE possibilities of costly service interruptions — assure greater continuity of service and customer goodwill — lower maintenance costs and do neat jobs—faster and more efficiently when you use time and field-tested Kearney Products... There are Kearney Trip-O-Matics—approved and used by operators everywhere who recognize the need and economy of better protection for their distribution systems... Kearney Con-Nec-Tites—exclusively designed with patented full round washers to provide proper mechanical and electrical characteristics for greater strength and conductivity... Improved Kearney Ground Clamp-Tites... Sure-holding Kearney Dead End Service Clamps that are used by the thousands. These are time and money-saving accessories you need to cut costs.

AND REMEMBER—KEARNEY FUSE LINKS are made to blow or not to blow—as protective requirements demand. Be sure to ask about them.

FOR PROFITABLE DATA ABOUT SWITCHING ACCESSORIES SEE BULLETIN 312



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SEVERE STORMS during late January and early February came to the rescue of California utilities dependent on water to produce their power. On-the-ground snow at the end of January represented but half the water content of the pack a year ago. The California Cooperative Snow Surveys, reporting Feb. 9, indicated, however, that the snow pack was almost doubled by the storms and approached normal. Precipitation, however, was far below normal in all Sierra watersheds. Areas drained by the state's northern rivers were at 50 to 60% normal. South of the Tehachapi range, the Santa Ana, San Gabriel and Los Angeles Basins ran 100 to 115% normal.

●

TOTAL VALUE of 1938 orders for electrical goods was $630,801,957 as compared with $930,170,359 in 1937, the Bureau of Census announced last month. Value of orders booked during the fourth quarter of 1938 was $160,374,036. This was a slight increase over the third-quarter figure of $158,958,951.

●

RIGHTS-OF-WAY for Seattle City Light transmission lines, Bonneville lines and Tacoma, Wash., municipal lines will be cleared under a WPA project totaling $917,757. Of this sum, $825,706 will be used for the Bonneville right-of-way to Condit, Wash., and Vancouver; $60,237 for the Seattle light department line through Skagit County to Diablo Dam, and the remainder for the Tacoma right-of-way through Mason County.

●

REA Activities

WASHINGTON *(McGraw-Hill Bureau)* — REA projects for which allocations have been made and on which work has been started totaled more than $98,000,000 as of Feb. 2. It is expected that the $32,000,000 left to REA out of its $140,000,000 appropriation will be allocated before the fiscal year ends June 30. In the 1940 budget REA will get $40,000,000. Indications are that there will be no difficulty in securing this sum for new and present projects. While it is considered too early to draw a definite conclusion as to the profitableness of the various REA cooperatives, it has been found that many are now showing profitable operations and are paying back part of the original advances in addition to meeting interest charges on loans advanced.

SAN LUIS VALLEY RURAL ELECTRIC COOPERATIVE, Monte Vista, Colo., has awarded a contract to C. E. Atwater Construction Co., Grand Island, Neb., for building 166 mi. of line, $118,033. The cooperative has been allotted $5,000 to finance house-wiring and plumbing installations.

SUN RIVER ELECTRIFICATION ASSN., Fairfield, Mont., has been allotted $54,000 to build 46 mi. of line in Teton County.

FERGUS COUNTY COOPERATIVE ELECTRIC ASSN., Lewistown, Mont., has been allotted $8,000 to finance house-wiring and plumbing installations.

COLUMBIA COUNTY (Wash.) RURAL ELECTRIC ASSN. has filed articles of incorporation. Dayton is given as principal place of business.

SOUTHEAST COLORADO POWER ASSN., Lamar, Colo., has awarded a contract to Driscoll Construction Co., Pueblo, for building 270 mi. of line. $221,348.

FARMERS ELECTRIC MEMBERSHIP CORP., Clovis, N. M., has awarded a contract to Reinhart & Donovan Co., Oklahoma City, for building 117 mi. of line. $63,400.

BENTON RURAL ELECTRIC ASSN., Prosser, Wash., has awarded a contract to Electric Smith, Spokane, for building 50 mi. of line. $35,650.

●

Contracts Awarded

TO BARRETT & HILP, San Francisco, for work on electricity and communications building, Golden Gate International Exposition, $18,987.

TO K. F. STOLTING, Santa Rosa, Calif., for refrigeration and dairy equipment for milk house at Eldridge, Calif., $2,696.

TO GENERAL ELECTRIC CO., Schenectady, for four 75,000-kva. generators for Shasta Dam, $2,490,999.

TO LEHIGH STRUCTURAL STEEL CO., New York, for four steel towers to carry Bonneville power from dam to North Bonneville, $41,580.

TO BETHLEHEM STEEL CO., San Francisco, for reinforcing steel bars for Shasta Dam power house, $119,781.

FOR USE in connection with third Boulder transmission line to Westinghouse Electric & Mfg. Co. for auto transformers, $560,856; to Allis-Chalmers Mfg. Co. for transformers, $432,253; to General Electric Co. for oil circuit breakers, $443,850; to Kelman Electric Mfg. Co. for oil circuit breakers, $80,414; to Anaconda Wire & Cable Co. for copper wire, $17,348.

TO NEWBERY ELECTRIC CORP., Los Angeles, for wiring the Wyvernwood low-rental housing project, Los Angeles.

TO RILEY STOKER CO., Worcester, Mass., for steam generator for power plant additions at Lamar, Colo., $41,736.

TO ENGLISH ELECTRIC CO., of Canada, Vancouver, for electrical equipment and transformers to be used in alterations of Canadian Bank of Commerce, Vancouver, and to Hume & Rumble, Vancouver, for electrical equipment. Total, including general alterations, etc., $175,000.

TO HUME & RUMBLE, Vancouver, B. C., for electrical work on addition to the department store of Woodward's Stores, Ltd., Vancouver.

TO H. J. SAYER & CO., Vancouver, B. C., for electrical work on building of Rae Sons Shoes, Vancouver. Total for remodeling, $22,000.

TO FAIRBANKS MORSE CO., Omaha, for furnishing and installing equipment in power plant at Sundance, Wyo., $18,291.

BY BONNEVILLE AUTHORITY for circuit breakers for substations to Allis Chalmers, Portland, $38,360; to Pacific Electric Mfg. Co., San Francisco, $90,900; to Westinghouse, Portland, $198,480.

TO GENERAL ELECTRIC CO., Schenectady, for three 55,000-kva. transformers to be connected with generating units Nos. 1 and 2 in the Arizona wing of the Boulder Dam power house, $376,350.

TO H. D. MAINWARING & CO., Victoria, B. C., for electrical work in a new store and apartment building in Victoria.

TO S. F. RICKETTS ELECTRIC, Vancouver, B. C., for wiring and fixture installations in a factory and warehouse modernization job in Vancouver.

TO C. C. CARTER, Vancouver, B. C., for wiring of a new building for Truck Parts & Equipment, Ltd., Vancouver.

TO W. O. ALLISON CO., Grand Junction, Colo., for constructing transmission line from Green Mountain Dam to Grand Lake, Colo., Colorado-Big Thompson project, $31,461.

TO WESTINGHOUSE ELECTRIC & MFG. CO., Los Angeles, for four 60-cycle, single-phase, outdoor-type, oil-immersed, forced-air-cooled auto transformers for use by the Los Angeles Dept. of Water & Power, $560,856.

TO G. H. ARMSTRONG, San Francisco, for electrical work on addition to Samuel Gompers Trades School, San Francisco, $18,774.

TRADE NOTES

Dealers & Distributers

HUDSON'S BAY CO. has purchased the stock, fixtures and building of the Arthur Hitchen Guaranteed Furniture Co., Nanaimo, B. C., and established a new branch store. For the present, the new store will specialize almost entirely in home furnishings and major electrical appliances. Manager is George White, who has been associated with Hudson's Bay Co.'s appliance department for six years.

●

ALBERTA FURNITURE CO., Vancouver, B. C., dealer, has opened a new store at 555 Richards St. The company maintains two other stores in Vancouver.

●

NORTHWEST BAKER ICE MACHINERY CO. has been incorporated as a British Columbia firm doing business in Vancouver as manufacturer of and dealer in refrigeration and other equipment.

●

COAST HARDWARE CO., Victoria, and McCallum Hardware, Vancouver, were first and second winners in Silex Co.'s Canada-wide window-display contest for dealers. B. C. Electric Railway, Vancouver, won first prize in the utility and department store classification of the contest. Victoria branch of the railway company won third prize. Six out of

Go Modern All the Way"...by Selling

1939 Hotpoint

ELECTRIC RANGES

HERE'S REAL SALES POWER FOR YOU

NATIONAL ADVERTISING

Hotpoint advertising ties up with the big Modern Kitchen Bureau "Guess Again" Campaign in the Saturday Evening Post. In addition Hotpoint advertising will also appear in five other national magazines through your heavy selling season, carrying the story—"Be Thrifty, Be Modern and Go Modern all the Way on Cooking."

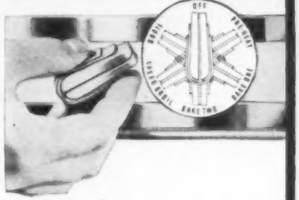
MODERN KITCHEN BUREAU CAMPAIGN

Hotpoint offers material to help bring the big "Guess Again" Campaign into sharp selling focus for you. Tie up with the M. K. B. Spring Drive. Use Hotpoint's Spring Swing Sales Plan. Material can be adapted to your individual needs. Newspaper mats, posters, direct mail, window and store display for spring sales activity now ready.

HOTPOINT RANGE FEATURE HELPS YOU SELL!

DIRECTIONAL HEAT OVEN

A big selling feature that wins customers—provides a variety of oven heats—five separate controls with one switch. Permits baking or roasting from a cold or pre-heated start. Two intensities of heat available in top units gives duo-speed broiling for steaks, chops, fowl.



Calrod COOKING UNIT TARGETS THE HEAT

1 Calrod heat is efficiently, effectively applied. It is used entirely for cooking.

2 Calrod heat is conducted through bottom of pan into food. There's no flame.

3 Calrod heat is accurately controlled. Five different heats from one switch.

New Features— New Models and a Great New "Battlecry"

Go modern, sell Hotpoint and get your share of the big volume of range sales that is predicted by electrical men everywhere.

Hotpoint's 1939 models are loaded with sales features that get orders. Five Speed, Select-A-Heat Calrod and Directional Heat Ovens give new economy arguments for range salesmen.

And the great new battlecry set up for range salesmen is—"Go Modern all the Way on Cooking." Story is—"Electricity is the *modern* fuel. Buy a range that is modern in method as well as appearance." Get all the facts about Hotpoint's new models, new features, new plans. Swing ahead with Hotpoint—The Headline for '39.

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5612 West Taylor Street, Chicago, Illinois

Be Thrifty Be Modern

Hotpoint

ELECTRIC RANGES • REFRIGERATORS

WATER HEATERS • DISHWASHER-SINKS • WASHERS AND IRONERS

Hotpoint Friendly Finance Plan Helps You Sell $1.19 a week

Stocks at San Francisco
Electrical Specialty Co., Inc.,
316 Eleventh Street

Stocks at Los Angeles
Electrical Specialty Co. of So. Calif.,
451 South San Pedro Street

Stocks at Seattle
Electrical Specialty Co., Inc.,
714 Fourth Avenue

For the Coast Trade

At your doorstep you now have an adequate stock of popular D-H alloys, wires, ribbons, rods and other forms.

Driver-Harris Company
Harrison, N. J.

TRADE MARK REG. U.S. PAT. OFF.
Nichrome

★ *For Quick Service on Quality Products from Local Stocks*

Get in Touch with: **GEO. E. HONN CO.**
420 MARKET ST. SAN FRANCISCO, CAL.

MANUFACTURER'S REPRESENTATIVE FOR:

PYREX INSULATORS, POWER AND RADIO
Corning Glass Works
FUSES, RESISTORS, MOUNTINGS, CUTOUTS, FUSE LINKS, DISCONNECTS, BUS SUPPORTS
Schweitzer & Conrad, Inc.
CAPACITORS
Cornell-Dubilier Corp.
TRANSFORMERS, POWER AND DISTRIBUTION
Gardner Electric Manufacturing Co.
CURRENT TRANSFORMERS, NIAGARA AIR INSULATED
Lee Skipwith Company
CABLE GRIPS
Kellems Products, Inc.
CONNECTORS, GROUND ROD CLAMPS, UTILITY HOIST
Jasper Blackburn Products Corp.
GROUND LINE POLE AND GREEN WOOD TREATMENT
Osmose Wood Preserving Company
TONG TEST AMMETERS—LOW VOLTAGE GENERATORS
Columbia Electric Mfg. Co.
UNDERGROUND CABLE TOOLS & EQUIPMENT
T. J. Cope, Inc.
TREE TRIMMING EQUIPMENT TREE SURGEONS' TOOLS
Bartlett Manufacturing Co.
FRICTION AND RUBBER TAPES
Clifton Manufacturing Co.
MEIER JEWELS
Herman D. Steel Company
SAFETY LINE TOOLS
Burnham Line Tool Company

It's Coming Next Month

The Manufacturers' Directory

Electrical West's annual directory lists all electrical manufacturers, their Western branch offices and representatives.

How many times have you wanted to buy some electrical product only to find you didn't know where to locate it? You knew nothing but the manufacturer's name?

Hundreds of times?

Then save yourself future worry. The Manufacturers' Directory is designed to give you all the information you require.

Be Sure you get—and save—the April issue of Electrical West.

ten fourth prizes were also won by Western Canada firms.

●

INCANDESCENT SUPPLY CO. held its first general sales meeting for all California branches in Fresno Jan. 21-22. Participating houses were San Francisco, Oakland, Los Angeles and Fresno.

●

FISHER-GLASSFORD HARDWARE CO., Fresno, Calif., has leased the premises of the Hockett-Cowan Music Co. and will spend more than $10,000 in enlarging several departments, including the appliance department. The Hockett-Cowan store, which handles appliances, will move across Fulton St., Owner C. F. Cowan having purchased Cook's Music Shoppe.

●

CROWSON ELECTRIC AGENCIES, San Francisco, is now the northern California and Nevada distributor for the Coburn One-Wire Electric Fence Co.

●

NOAD & NICHOLAS, San Francisco electrical manufacturers' agency, became Nicholas & Cook Feb. 1, when E. B. Cook bought out the interest of Arthur Noad.

●

THOMPSON & HOLMES, San Francisco appliance distributor, has opened a branch office in Fresno, Calif. Victor Chambers and his assistant, Frank Young, are in charge.

●

FRESNO (CALIF.) REFRIGERATION & HEATING CO. has been opened by Roy Van Maren, formerly a co-partner in Reliable Refrigeration Co., Bakersfield, Calif. The new firm will distribute refrigerator and air-conditioning units and accessories in Fresno, Kings, Tulare and Madera Counties.

●

ELECTRICAL SUPPLIES DISTRIBUTING CO., San Diego wholesale establishment, has opened a new branch at El Centro, Calif., to serve the Imperial Valley territory. Milton Taylor is in charge.

●

OAKLEY ELECTRIC CO., Boise, Ida., mails out some 5,000 copies of its own little magazine every other month to a list of prospects and customers. Results in sales are good.

●

HERB E. ZOBRIST CO., Seattle, has remodeled and enlarged its radio-parts department and has added a complete line of parts for all refrigerators, radios and washers.

●

KEN H. BEST, for the past few years an employee of Tips Tool Co. and A. B. Chance Co., has set up in Seattle as a manufacturers' representative specializing in high-line equipment.

SCHOENFELD'S, Tacoma department store, has enlarged its appliance department and moved it to the main floor. Purpose was to make the department attractive to men as well as women. Experience had shown that men hesitate to go through the whole store in order to find appliances.

●

GLOBE ELECTRIC CO., Seattle, has been appointed wholesale distributor in the Seattle area for the new Philco "Conservador" refrigerator.

●

POOLE ELECTRIC CO., Seattle radio and appliance store, has opened a camera department and a photo studio in the charge of Ernest Kassowitz.

●

Utilities

FIRST LOCKER cold-storage plants to be established in the farming communities of the lower British Columbia mainland have been set up at Langley Prairie, Abbotsford and Chilliwack. The development was materially assisted by the agricultural department of B. C. Electric Railway. Plans for erection of several similar plants on Vancouver Island are now under consideration.

●

PROVO DIVISION of Utah Power & Light Co. won third prize in its class in the Silex window-display contest. LeRoy Condie, display manager who previously won a prize in the Modern Kitchen Bureau's water-heater window, designed the display.

●

GRAYS HARBOR RAILWAY & LIGHT CO. has discontinued its monthly publication, the *Synch-onizer*.

●

Moved

KLINE BROS., Trail, B. C., appliance store into a building especially erected to meet the firm's requirements.

HASKINS & ELLIOTT, Vancouver, B. C., radio and appliance store, from 27 West Hastings St. to 46 West Hastings St.

HON ELECTRIC CO., Boise, Ida., to a new store near Idaho Power Co.'s office.

MAST RADIO, INC., Seattle radio and appliance store, to larger premises at 1300 Fourth Ave.

HERMAN'S ELECTRIC, Trail, B. C., appliance store now known as Herman's Appliances, from 954 Spokane Ave. to corner of Farwell & Cedar.

●

Contractors

RELIANCE ELECTRIC, Trail, B. C., has completed the wiring installation in the new Bergerson block of stores and offices in Trail.

WIREMOLD
FLUORESCENT STRIP

Right now is the time to take full advantage of the many business building opportunities opened up by this new and revolutionary type of lighting for display, commercial and industrial installations. Wiremold Fluorescent Strip is economical, easy to install and includes scientifically correct specular finish Alzak aluminum reflectors which can be used in either symmetric or asymmetric position.

Here's the up-to-the-minute information you need on how to sell and install Fluorescent Lighting

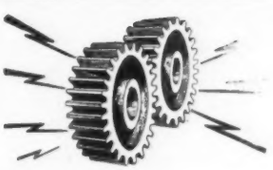
Wiremold data sheets and engineering service are yours for the asking. Send us the information on Fluorescent jobs in your territory and let us help you turn them into profitable contracts.

ADEQUATE WIRING SERVES AND SAVES

WIREMOLD *Your* BUSINESS BUILDER

THE WIREMOLD COMPANY . HARTFORD, CONN.

ELECTRIC CONTROLS FOR INDUSTRY

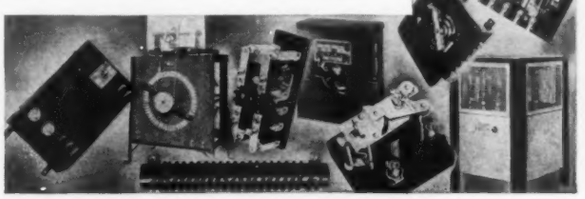


The vast experience of Ward Leonard includes the entire period of the application of electricity to industry. Usable data is therefore available for practically every type of control. In the Ward Leonard line of industrial controls you will find a piece of equipment that intimately meets all your requirements without the need of special development. Study the bulletins that will be gladly sent to you upon request. They may save you time and money and result in a more efficient application of power.

RELAYS — SPEED REGULATORS
RHEOSTATS — MOTOR STARTERS
RESISTORS — CONTACTORS
VOLTAGE REGULATORS

WARD LEONARD
48 SOUTH STREET, MOUNT VERNON, N. Y.
Electric Control Devices Since 1892

Send for bulletins of interest to you.



New Inside and Out!

New styling, new features, new convenience—and a new low price—make the 1939 General Electric the greatest refrigerator "buy" G-E ever offered. "Built for keeps" it has everything needed for thrifty, convenient, safe preservation of food. Nothing experimental about it—both the buyer's food and investment are safe in the G-E!

SELECTIVE AIR CONDITIONS AND NEW LOW PRICES

The new 1939 General Electric gives different *combinations of temperature and humidity* necessary to keep foods at their fullest, finest flavor—and provides the most practical method of food preservation at low cost. No other refrigerator in the world keeps foods looking and tasting better, and retains more of the health-giving vitamins longer, than does the 1939 G-E with SELECTIVE AIR CONDITIONS.

General Electric has built more *sealed* refrigerating mechanisms than any other manufacturer. From the famed G-E "House of Magic" came forced-feed lubrication, oil cooling, acoustic mufflers and "floating power." These advanced features of the G-E Thrift Unit assure quiet operation, low current cost, long life.

GENERAL ELECTRIC CO., SPECIALTY APPLIANCE DIVISION
Nela Park, Cleveland, Ohio

GENERAL ELECTRIC
Triple-Thrift REFRIGERATORS

Visit the Golden Gate International Exposition, painted with light by General Electric. See our G-E "House of Magic."

BUY G-E AND GET ALL THREE!
1 TELL-A-COOK LIGHTS
2 SELECT-A-HEAT COOKING UNITS
3 TRIPL-OVEN (3-in-1)
JONES ELECTRIC STORE
500 SO. MAIN ST.
THE SWING IS TO THE ELECTRIC RANGE

Above is reproduction of G-E's first 24-sheet poster for '39

JONES IS SELLING RANGES!

This NEW Demonstration Kit Rings the Bell!

The NEW Way to Sell Ranges

Intrigues interest, captures imagination, arouses desire, leads prospects step by step to the dotted line! Another *exclusive* for General Electric Range Dealers.

THE BIG news in electric ranges this year is General Electric's *Three Thrifty Features*—and it's pulling 'em in fast to G-E dealers' display rooms from coast to coast. It's exclusive with G-E—a sensational sales scoop. Proof? G-E Range sales are *already* hitting new highs!

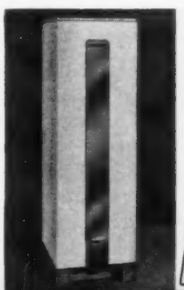
Only the G-E Has All Three!

Tel-A-Cook Lights in Color—Select-A-Heat Calrod Cooking Units—Nu-Flex Tripl-Oven—only the General Electric has all three—and what a demonstration they make! If *you* want to sell s-e-l-l S-E-L-L electric ranges this year, 'phone your G-E distributor now and ask him to give you the thrilling story of the G-E Range Line for 1939—the line with the *Three Thrifty Features*. General Electric Co., Specialty Appliance Div., Nela Park, Cleveland, O.

Visit the Golden Gate International Exposition, painted with light by General Electric . . . See our G-E "House of Magic."

G-E WATER HEATERS

Water Heaters are coming to the front this year! Get your share of this profitable business that is practically void of service problems! In the complete G-E line are models for every requirement, including the *new* 2-gallon size for wall installation over sinks in small homes, cottages, small commercial establishments, professional offices, etc.



GO G-E ALL THE WAY!

A FULL line of electrical appliances that win public preference through performance.

General Electric Refrigerators, Ranges, Electric Sink (with Dishwasher and Garbage Disposall), Water Heaters, Washers, Ironers—also "Packaged" Commercial Refrigeration Products.

GENERAL ELECTRIC

Electric Ranges and Water Heaters

Wire-Nuts
IDEAL SOLDERLESS TAPELESS WIRE CONNECTORS
Millions Now in Use!
HERE'S HOW!
Better Electrically
Stronger Mechanically
1 SKIN WIRES
2 SCREW ON
THAT'S ALL!
No Twisting of Wires Necessary! Wires are automatically twisted and threaded together when "Wire-Nut" is applied.
Samples on Request
Fully Approved Listed by Underwriters' Laboratories, Incorporated
ELECTRICAL PRODUCTS DIVISION
Ideal Commutator Dresser Co.
1042 PARK AVENUE, SYCAMORE, ILLINOIS

Is an AGENCY ACCOUNT expensive?

By saving valuable time and avoiding losses due to mistakes and delays, our Agency Service for handling securities often is an actual economy rather than an expense. But in any event the cost is moderate. Send for our descriptive booklet, *An Introduction to Agency Service.*
Just ask for Booklet M-3
CROCKER FIRST NATIONAL BANK
OF SAN FRANCISCO
California's Oldest National Bank

PETERSON ELECTRICAL CONSTRUCTION Co., Vancouver, B. C., contractor specializing in wiring work on B. C. Electric Railway substations, has awarded a contract for construction of a new $11,000 warehouse, display room, workshop and office.

●

DAVID MATHER, plumbing and electrical contractor in Nez Perce, Ida., has added a complete line of small electric appliances. Major appliances are to be added later.

ABOUT PEOPLE

Chapman Succeeds Marsden As San Diego President

Walter F. Chapman, of San Diego Consolidated Gas & Electric Co., has taken up duties as president of the Electric Club of San Diego. He succeeds William A. Marsden, of George Belsey Co.

First vice-president is Gerald W. Heilbron; second vice-president, William H. McKinley; secretary-treasurer, William C. Wilt. Directors are W. C. Gill, R. T. Redfield, L. B. Jones, E. Evan Shaffer and Marsden.

Committees are composed of: Speakers—G. H. P. Dellmann, chairman; E. I. Hazie, Sid Fuller, E. T. Bailey, Walter Chapman, Redfield, Marsden and Heilbron; reception—Jack Kirchmaier, chairman; J. B. Lyon, S. B. Houser, Robert Tufts, J. P. Holloway and F. Q. Irwin; publicity—J. C. Chamberlain, chairman; R. M. Raymond, H. E. Callaway; program—Jones; finance—Marsden, chairman; Gill, Shaffer, Redfield and Jones.

Membership — McKinley, chairman; Bart Murray, William Powell, W. S. Rainey, O. G. Thompson, Glenn Dutton, and Lester Earnest; electrical development & safety—R. A. Edwards, chairman; (electrical home) Gene Cramer, Heilbron, Marsden, Redfield; (safe wiring) J. F. Zwiener, J. R. Barry, Shaffer, Gill; (street & highway lighting) A. E. Holloway, A. I. Benedict, C. M. Thompson and McKinley.

Attendance—W. J. Lainson, chairman; S. V. Weimer and McKinley; visiting & relief—A. E. Johnstone, chairman; William deWaard, and Bailey; entertainment—R. C. Cavell, chairman; J. W. Salyers, B. H. Rogers, J. G. Brown, A. F. Stoll, E. K. Lyon and C. S. Kirchmaier.

●

ROBERT W. CLARK, merchandising manager of Puget Sound Power & Light Co., has been appointed a member of the national committee of the Electric Water Systems Council.

San Francisco Contractors Elect Carl C. Severin

Carl C. Severin, pioneer electrical contractor of San Francisco and largely responsible for bringing into the association the large group of contractors formerly organized as the Master Electricians' Assn., has been elected president of the San Francisco Electrical Contractors' Assn. He succeeds G. Walter Spencer.

George W. Abbett has been re-elected vice-president; Edward Martin, secretary, and George Smith, treasurer.

Board of directors is composed of William Weindorf, Edward W. Scott, Clyde L. Chamblin, James Surtees, Bert J. Doherty, Tom Harris and Spencer. They reappointed W. J. Varley as business representative.

●

A. GORDON MEEKISON, president and general manager of Clarkson's, Ltd., Vancouver, B. C., appliance store, has been elected chairman of the Retail Merchants' Bureau of the Vancouver Board of Trade. C. E. Jarvis, general manager of Jarvis Electric & Refrigeration Co., and James Lightbody, publicity manager of B. C. Electric Railway Co., have been re-elected as directors of the Advertising & Sales Bureau of the Board of Trade.

●

JOHN F. BOOTHE, advertising manager of Brown-Johnston Co., Spokane, has been named retail store manager to succeed Howard Murray, who has retired. In announcing the change, Eric A. Johnston, company president, said that the air conditioning department will be incorporated in the firm's retail activities and the service department will be enlarged.

●

MERRITT E. SHOTWELL, Twin Falls service foreman for Idaho Power Co., has been awarded an Edison Electric Institute medal for saving the life of a fellow worker last year.

●

JOHN DUNSMUIR, managing director of Mackenzie, White & Dunsmuir, Ltd., Vancouver, B. C., wholesale establishment engaged in distribution of electrical appliances, radio and supplies, has been elected president of the Vancouver Exhibition Assn.

●

ALEX FORST, president of Forst's, Ltd., Vancouver, B. C., dealer, has been reelected president of the Hastings Chamber of Commerce. J. A. Bragg, head of the Bragg chain of hardware and appliance stores, has been elected chamber vice-president. Hastings is a suburb of Vancouver.

Marching along together

STEEL.. STYLE.... COMFORT

Except for *steel*, the shoes we wear would be little better than medieval sandals, with their shapeless ugliness and destruction of foot health.

The arch which assures comfort, safety, lasting appearance, is made by a steel brace concealed in the leather. Heels are possible because of steel nails. Steel eyelets keep the laces from tearing the leather. The laces thread easily because of steel tips--to say nothing of the steel machinery vital to processing the leather and making the shoes themselves.

It takes almost 100 pieces of steel to make most pairs of modern shoes, and they are only a small fraction of the thousands and thousands of pieces of steel you use every day to make life comfortable and safe. Steel makes possible your electric light, home heating plant, canned food delicacies, automobile, office building and factory, railroad--in fact steel makes possible the standard of living on which civilization depends.

For almost every one of this multitude of uses a special steel is required, and Youngstown maintains a great laboratory and special staffs of research and field experts to find exactly the right steel for every modern use.

QUALITY TRADE MARK YOUNGSTOWN SERVICE

Sheets - Plates - Pipe and Tubular Products - Conduit - Tin Plate - Bars Rods - Wire - Nails - Unions - Tie Plates and Spikes

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices
YOUNGSTOWN, OHIO 25-11B

What Men Like You

G-E SPIRAKORE

A New England utility executive states:
"Your wound-core construction is the biggest advance in distribution-transformer design that I have seen since I first started in the utility game twenty years ago. I would like to see this design in the larger sizes just as soon as you can possibly furnish it—say, in sizes 5 to 25 kva—and why stop there?"

A Southern utility engineer, in charge of maintenance and repair, states:
"It looks as if my job is going to be easier from now on. That wound-core transformer is so simple that there does not seem to be anything on it to go wrong. I do a lot of transformer designing in my line of work, and I can usually see things in a manufacturer's design that can be made better if done my way; but this is one time when you fellows have made a transformer which I can't think of any way to improve upon."

An Illinois utility purchasing agent states:
"This new wound-core design is the biggest contribution to the extension of rural electrification that has been made since our program for installing rural lines started. The lower cost has made possible the addition of several transformers in at least one locality where our budget figures indicated it would not be economical to supply service without the lower investment."

A New York State operating engineer said:
"I could stand here and watch that machine all day! It's fascinating! Every transformer leaving that machine is exactly like the last one. It is the last word in uniformity."

After seeing the core-winding operation, one customer remarked:
"I have seen the wound-core sample transformer your specialist had, and it looked so neat and compact I wondered why you had not built that design years before. The specialist told me that it was because no one had figured out a way previously to assemble the core and still retain minimum losses. I sat down later and figured out at least three ways of winding that core, but it wasn't until I had seen your method that I could see how the strains were entirely eliminated and the core iron used to its maximum efficiency."

A prominent efficiency engineer said:
"I have always been enthusiastic over the conservation of material as long as quality was not reduced. You have reached the optimum with the wound core where you have not only eliminated all scrap, but you are working every square centimeter of iron to its maximum efficiency. That is a wonderful engineering accomplishment."

One distribution engineer commented from another angle:
"The G.E. have already made friends with our linemen due to the reduction in physical size effected by the new wound-core design."

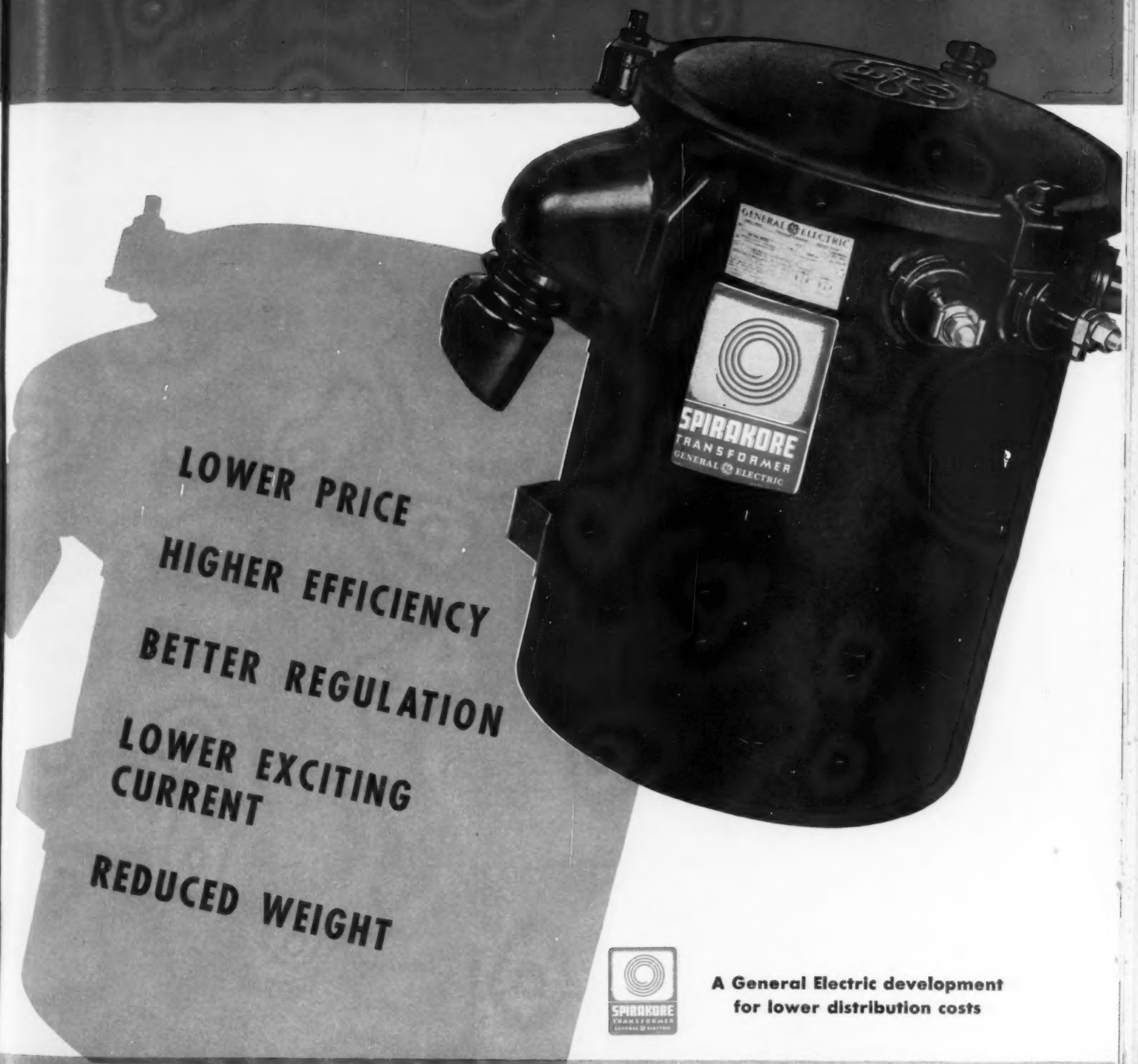
For additional facts about the SPIRAKORE transformer, ask your G-E representative for brochure GES-2038, which tells the story of the development of the wound-core design. For complete descriptive data, ask for Bulletin GEA-3085. General Electric, Schenectady, N. Y.

GE

G E N E R A L

are Saying About the

TRANSFORMER



LOWER PRICE

HIGHER EFFICIENCY

BETTER REGULATION

LOWER EXCITING CURRENT

REDUCED WEIGHT

SPIRAKORE TRANSFORMER

A General Electric development for lower distribution costs

E L E C T R I C

300-76

Hill Named Chairman by Northern California IAEI

Ben Hill, chief inspector of Oakland, was last month elected chairman of the Northern California Chapter, Southwestern Section, IAEI. He succeeds A. V. Youens of Palo Alto.

Named vice-chairman was E. H. Snedaker, chief inspector of San Jose. Harold Gerber, chief inspector of San Francisco, was reelected secretary-treasurer.

Speakers at the meeting, held in San Jose Feb. 8, were George Kimball, electrical engineer for the Industrial Accident Commission, who quizzed members on their experience with fibre-insulating washers in fuse plug holders, and Gerber, who recommended that only 450 watts of fluorescent lighting be placed on any one 1,500-watt circuit.

Next meeting of the chapter is scheduled for Treasure Island, San Francisco, sometime in May.

●

Seibert, Heston Set P.G.&E. Sales Record

San Francisco Division of Pacific Gas and Electric Co. last year sold 11,066 pieces of domestic lighting equipment and auxiliary electric heaters, representing $33,792 in revenue. Two salesmen who contributed most to this record were Jack Seibert and Walter Heston.

Seibert, who was employed April 6, 1938, sold 1,003 pieces of equipment in 8½ months. Heston, who was employed Aug. 1, 1938, sold 550 pieces of equipment. Revenue records for the two men were: Seibert, $4,126; Heston, $1,750.

●

W. C. MAINWARING, general sales manager of B. C. Electric Railway Co., has been elected second vice-president of the Building & Construction Industries Exchange, Vancouver.

●

K. M. ANDERSON, district manager of Steel & Tubes, Inc., Los Angeles, has resigned to become Los Angeles district manager of Appleton Electric Co., conduit-fitting manufacturer.

●

O. M. SLACK and G. A. Howarth, of Utah Power & Light Co., won first and second prizes in *Timely Ideas*' essay contest for power representatives. Subject was "My Most Helpful Recommendation."

●

R. D. HORNING, manager of the Seattle Electrical Contractors' Assn. since 1936, has been named chairman of the Seattle Adequate Wiring Bureau succeeding J. J. Agutter. He will carry the work in addition to his contractor duties.

B. W. Dreyer (left), formerly with Steel & Tubes, Inc., in Indianapolis, is new southern California representative for the company. Arthur Grove (right) is the organization's northern California representative

CHARLES E. CAREY, principal construction engineer of the Bonneville project, has been appointed temporary assistant administrator of the project in the absence of J. D. Ross. Ross, who underwent an abdominal operation at Mayo Clinic, Rochester, Minn., will be off duty for three months.

●

MISS ANNE MCDONALD, a member of Pacific Gas and Electric Co.'s legal staff, has been chosen president of the Queen's Bench, an organization of northern California women attorneys.

●

EARL OLSON, Idaho Power Co., was active arranging the program for the Intermountain Assn. of Hardware Dealers & Salesmen, which held its convention at Boise Feb. 1-3. E. J. Strike, Idaho Power president, was one of the convention speakers.

●

CHARLES E. HESS, Puget Sound Power & Light Co.'s commercial and industrial representative in Snohomish County, has been transferred to the company's general office in Seattle as merchandise coordinator.

●

Anaconda Transfers Casey to San Francisco

Ed Casey, former Denver district manager of Anaconda Wire & Cable Co., has been transferred to San Francisco, where he is division manager for the entire West Coast. He has supervision over the San Francisco, Los Angeles, Seattle and Denver territories. A. W. Dunham, Jr., succeeds him at Denver.

Other Anaconda changes include the appointment of F. W. Snow, Jr., as manager of the Los Angeles district. He succeeds Lloyd Hanlon, who has resigned. Frank Claycomb has been shifted from the Detroit to the Los Angeles district.

A. E. SCHANUEL, field representative for the National Adequate Wiring Bureau, is scheduled to make an extended trip through the West this spring. He will be in Texas and Arizona the week beginning April 9; California, April 16; Oregon and Washington, April 23; Montana and Idaho, April 30, and Utah and Colorado, May 7.

●

RICHARD FLATLAND, one of the family operating Globe Electric Works, San Francisco, has resigned to open a business under his own name.

●

CHARLES E. JOHNSON, for many years in charge of street lighting for Westinghouse, Los Angeles, is now affiliated with Joslyn Mfg. Co., Los Angeles, as representative of United States Electric Co.'s street-lighting equipment.

●

L. B. FLINT, Salt Lake City Kelvinator distributor, was winner of an automobile and a trip to Europe as a result of his success in last year's national refrigerator sales contest.

●

Personnel Changes Made By Nev-Cal Electric

Nevada-California Electric Corp. has put into effect a number of changes in personnel.

A. S. Cooper, assistant treasurer, was retired after being connected with the company for 32 years. At the time of his leaving he was the oldest employee in point of service. He was succeeded by A. G. Kieser, a member of the treasury department since 1920.

Leon S. Heseman, credit agent, took over Kieser's former office as assistant treasurer. Cleo Thomas, assistant credit agent, was promoted to credit agent and was succeeded by Borneo Stoker.

In the Imperial Valley, W. T. Johnson, superintendent of operations, was appointed district manager at El Centro. William McCulloch, sales supervisor, was given additional duties as sales manager. W. L. Bennington, commercial manager at El Centro, was transferred to the executive department of the general office in Riverside for special assignment work.

●

E. K. ALBERT, superintendent of transmission and distribution of Northwest Public Service Co., Huron, S. D., has been appointed chief engineer of California Pacific Utilities Co., San Francisco. The California company operates power systems in Susanville, Weaverville and Needles, Calif.

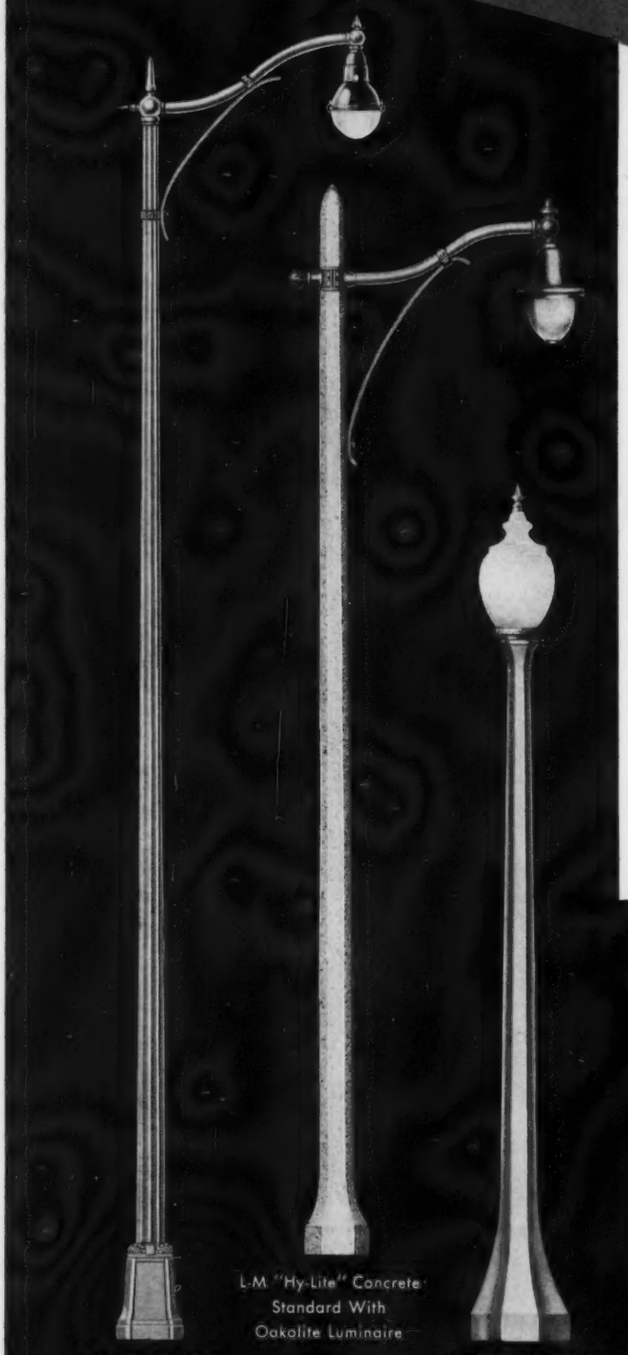
●

ARTHUR M. JOHNSON, formerly supervising engineer for S & M Lamp Co., Los Angeles, is now district manager.

EVERYTHING YOU NEED

in Street Lighting Equipment

Complete White Way, or just a few replacement parts . . . your L-M representative stands ready to give you his fullest cooperation. In the complete L-M Street and Highway Lighting line you will find the *right* equipment for your job . . . in efficiency, good appearance, and low maintenance cost. L-M Service Offices at Oakland, Portland, Seattle, Los Angeles, Phoenix and Denver.



L-M Pressed Metal Standard With Spherolite Luminaire

L-M "Hy-Lite" Concrete Standard With Oakolite Luminaire

L-M "Liberty" Cast Iron Standard With National Jr. Luminaire

L-M Spherolite Luminaire With Ornamental Design

L-M Controlite Luminaire

LINE MATERIAL CO.

It shines for you!

For 60 years it has been General Electric's policy to manufacture quality products, to price them fairly, and to deal fairly with its customers.

As a result, today, General Electric is one of the best-known names in the electrical industry, and the General Electric monogram is one of the best-known and most-respected trademarks in the entire world.

In a word, General Electric products have acceptance, and certainly this is true of General Electric Fans, the first electrical appliance manufactured by the General Electric Company, and a product whose sales to date, to customers of all types, add up to millions of units!

This background of experience and prestige is a bonus you get when you carry G-E Fans. You pay nothing for it, because General Electric Fans are competitive in price with other high-quality fans. Why not enjoy it?

The salesman of your local G-E Fan Distributor will be around soon to show you his copy of the unique G-E Fan Portfolio, "LET'S GET DOWN TO BRASS TACKS." Watch for him—listen to him—and profit by his sound advice!

APPLIANCE AND MERCHANDISE DEPARTMENT
GENERAL ELECTRIC CO., BRIDGEPORT, CONN.

GENERAL ELECTRIC

I. B. ADAMS and the San Jose division of Pacific Gas and Electric Co. were 1938 winners of the James B. Black Perpetual Sales Trophy awarded annually for the outstanding sales record. Adams is San Jose division manager. Shasta division—G. R. Milford, manager—was second; East Bay division—L. H. Newbert, manager—third.

●

PETER LAYTON, formerly with Valley Electrical Supply Co., Fresno, Calif., has joined Graybar's Fresno organization as appliance salesman. He succeeded Wiley Doran, who has joined Western Insulated Wire Mfg. Co., Los Angeles.

●

GEORGE T. CLARKE, electrical sales promotion manager for McLennan, McFeely & Prior, Vancouver, B. C., wholesale and retail electrical establishment, has been appointed western Canada representative for N. Slater Co., Ltd., Canadian electrical manufacturer. He succeeds A. T. Chambers, who retired after 22 years service with the company.

●

PHOEBE G. GILLAM has been appointed home service director of Portland General Electric Co., succeeding Susan H. Miller, who resigned to marry.

●

F. D. CROWTHER, a graduate of Oregon State College, has been named commercial assistant to A. F. Dickerson, manager of the General Electric illuminating laboratory and lighting sales section at Schenectady. Crowther has been with the company since 1927.

●

NOMINATED last month to the Los Angeles Board of Public Works was Harry W. Dennis, former chief civil engineer of Southern California Edison Co. Dennis joined the company in 1909 as a construction engineer. He served in various engineering capacities until his appointment as chief civil engineer in 1926.

●

GEORGE GILLEARD, salesman for Curtis Lighting, Chicago, and a University of Wyoming graduate, has been awarded the Stanford University fellowship to further independent research on store lighting.

●

RAY S. CAMP, formerly superintendent of San Joaquin Power's Tule power house, has been named superintendent of the Balch power house succeeding the late H. S. Minor. A. Ferguson is the new superintendent at Tule.

IT MUST BE RIGHT

smooth sailing with TRIANGLE

TRIANGLE PRODUCTS GO PLACES

Specify! TRIANGLE

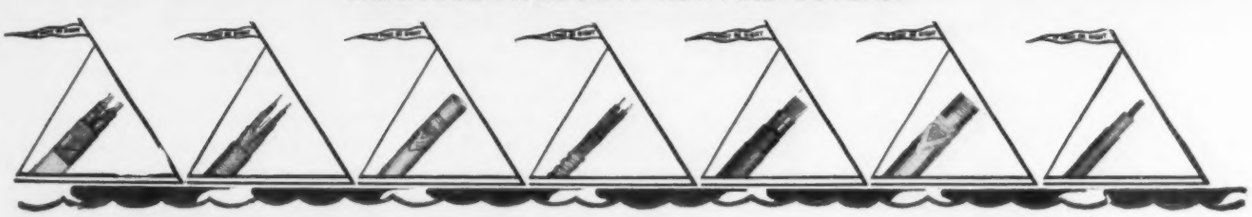
AS SMOOTH AS A GUN BARREL!

EMT
Electric Metallic
TUBING

HOT DIP GALVANIZED! *Inside and Outside!* PLUS BAKED-ON LACQUER FINISH! *Inside and Outside!*

...AND IT COSTS NO MORE!!

TRIANGLE PRODUCTS REWARD BUYERS!



TRIANGLE CONDUIT & CABLE COMPANY, INC.

Horace Harding and Queens Blvds.
Elmhurst, New York City, N. Y.

Pacific Coast Division: C. C. Hillis, Vice-President in Charge of Sales, 390 Seventh St., San Francisco, California

RMEL Division, Section Chairmen Appointed

W. N. Clark, president of the Rocky Mountain Electrical League, has announced the following division and section chairmen for 1939:

Contractors' division—R. Y. Chedister, Denver; utilities' division—L. R. Storey, Greeley, Colo.; vice-chairman, sales & promotion section—G. W. Milliken, Pueblo, Colo.; dealers' division—Herb Names, Denver; accounting section—Harry Adler, Denver; manufacturers' division—Paul A. Douden, Denver; engineering section—L. M. Robertson, Denver; distributors' division, E. V. Beck, Denver.

●

FRANK MARSH, former division manager for B. C. Electric Railway Co., has joined the staff of McLennan, McFeely & Prior, Ltd., as manager of its retail appliance sales in greater Vancouver. The company distributes the Frigidaire and Westinghouse lines.

●

FRANK MCLAUGHLIN, president of Puget Sound Power & Light Co., has been reelected vice-president of the Seattle Chamber of Commerce.

●

H. W. HITCHCOCK, chief engineer of Southern California Telephone Co., has been nominated by the American Institute of Electrical Engineers' nominating committee for the post of vice-president representing the Pacific district. F. Malcolm Farmer, vice-president and chief engineer of the Electrical Testing Laboratories, N. Y., has been nominated for president. The offices become vacant Aug. 1.

●

JOSEPH E. SCHUMACHER has resigned from his post as Los Angeles Water & Power Commissioner.

●

FRANK A. EASTON, in charge of dealer coordination work for Valley Electrical Supply Co., Fresno, Calif., has become San Joaquin Valley representative of the James Graham Mfg. Co., maker of gas ranges.

●

E. E. JONSSON, of Salt Lake City, is the new representative of REA'S utilization division for the Rocky Mountain Section.

●

SPENCE REESE has been appointed West Coast district manager for the radio division of Stewart-Warner Corp.

●

JOE H. ANDERSON, for many years manager of the range and appliance department of Powers Furniture Co., Portland, has retired after 27 years of service. He is succeeded by A. T. Erickson.

Robert Carr Lanphier, 61, president and founder of Sangamo Electric Co., Springfield, Ill., died Jan. 28. Mr. Lanphier, long outstanding in the electrical industry—particularly in the manufacturing end—was well known in the West. He had visited here often

J. D. FRANTZ, for over two years an engineer in Northwestern Electric Co.'s underground department, has been appointed assistant superintendent of the department. He succeeds T. W. Swartz, who became superintendent of Hawaiian Electric Co.'s underground department last fall.

●

MILT SARGENT, formerly of Idaho Power Co.'s Blackfoot office, has been transferred to Pocatello as assistant office manager. He succeeds M. M. Ilch, new chief clerk in the accounting department. Sargent is replaced by Lawrence Monroe, of American Falls.

●

L. E. KARRER, executive assistant to the vice-president of Puget Sound Power & Light Co., has been named manager of the North Coast Transportation Co. His headquarters are in Seattle.

●

KINSEY M. ROBINSON, president of Washington Water Power Co., has been chosen a vice-president and member of the executive committee of the Spokane Chamber of Commerce. Eric A. Johnston, president of Brown-Johnston Co., Spokane contractor-dealer, is also a member of the executive committee.

●

JAMES BLACK, formerly salesman with Modern Utilities Co., Helena, Mont., has joined Palmquist Electric Co., Helena.

W. M. MOTT, head of Mott Electric, New Westminster, B.C., and a member of the city council, has been appointed chairman of the council's civic reverted lands and industrial committee.

●

ERNEST H. ADAMS, vice-president and comptroller of B. C. Electric Railway Co., is a member of the new provincial advisory council on British Columbia tourist affairs.

●

CURTIS W. SPILLERS, credit supervisor of Puget Sound Power & Light's Central division, has been elected president of the Seattle Junior Chamber of Commerce.

●

F. J. MAHR, of Pacific Gas and Electric Co., was seventh prize winner in the national contest conducted by General Electric Co. for the best papers on "How to Select and Apply Small Electric Heating Units." Mahr was the only prize winner west of the Mississippi River.

●

Deaths

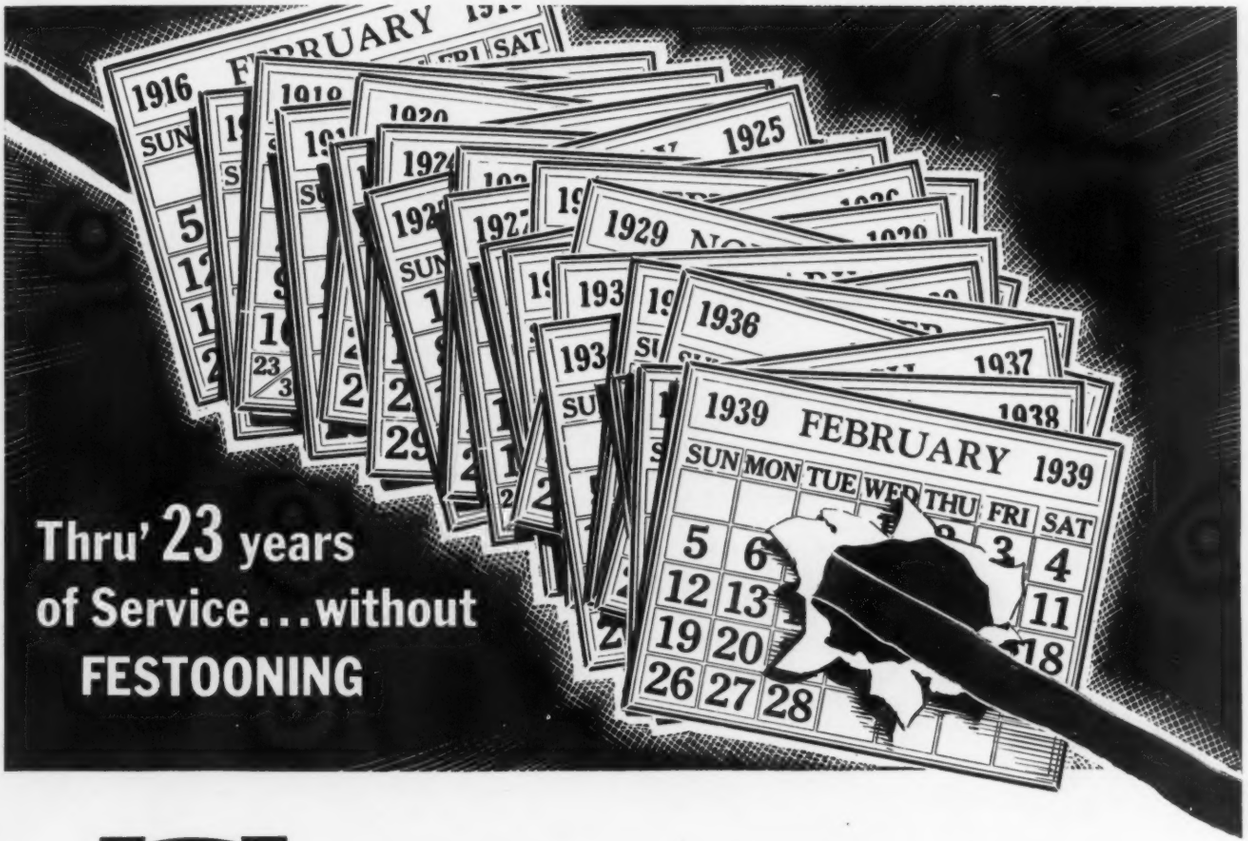
PERCY H. BOOTH, 61, one of the founders of the Hotpoint Electric Heating Co. in 1904, died Feb. 8 at his home in Los Angeles. A graduate of the University of California, Mr. Booth was active in both the electrical business and civic affairs. As a Hotpoint founder, he supervised construction of that company's Ontario, Calif., factory. When the company merged with the Edison Electric Appliance Co. in 1918 and became the Edison G-E Appliance Co. he was made vice-president and Pacific Coast sales manager. He was active in that business until 1932, when he resigned to attend to personal affairs. At the time of his death he was president of the Sierra Talc Mining Co.

●

LISLE R. SHEELEY, Pacific Power & Light Co.'s district manager at Yakima, Wash., died Jan. 16. Mr. Sheeley joined the company soon after its organization in 1910. He advanced rapidly in the clerical end of the business until in 1924 he was sent to Bend, Ore., as superintendent of the company's subsidiary, the Bend Water, Light & Power Co. When this company was absorbed, Mr. Sheeley was made district manager. He was transferred to Yakima, Pacific Power's largest district office, in 1929. Strain of the pre-election campaign against formation of a PUD in Yakima County is said to have contributed to his death.

●

CARL E. HARDY, 62, superintendent of the electrical division, City of Oakland, died Feb. 15 of heart disease.



GENERAL CABLE
GENERAL CABLE
GENERAL CABLE
Electrify with COPPER

PEERLESS* URC *Weatherproof*

The above sample from a seaboard installation has withstood all that Nature can impose by way of harsh weathering. The braid is gone—but the unique Peerless unspun cotton cover is whole—unbroken—continuous after 23 years of service. There is probably no other weatherproof with such a record of longevity.

*Trade-Mark

GENERAL CABLE CORPORATION

Sales Offices: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT • LOS ANGELES
NEW YORK • PHILADELPHIA • PITTSBURGH • ROME (N.Y.) • ST. LOUIS • SAN FRANCISCO • SEATTLE • WASHINGTON (D.C.)

Born in Rome, Ga., he came to California in 1908 as electrical engineer for Mare Island Navy Yard. Later he spent four years as commercial and industrial engineer in Westinghouse's sales department. He was appointed chief of Oakland's electrical division in 1915. Outside of his regular work, Mr. Hardy has been president of the Southwestern Section, International Association of Electrical Inspectors; second vice-president of the IAEI itself, and long a member of the executive council. For many years he represented the Southwestern Section on the electrical committee of the NFPA, the National Electrical Code making body. He was a member of the AIEE and had been advisor to the State Industrial Accident Commission and the Bureau of Standards.

●

A. A. CALDWELL, 70, former California State Senator and general manager of the Turlock office of Pacific Gas and Electric Co., died Feb. 16 after a long illness. Mr. Caldwell became general manager at Turlock in 1926 and served the company until his retirement in 1937.

●

RALPH E. TOWNE, of Tacoma, Wash., senior member of an engineering firm representing 12 county public utility districts in Washington, died Jan. 20. Mr. Towne had formerly been connected with the Tacoma and Puyallup municipal systems.

●

Speakers

At Pacific Power & Light Co.'s business development conference, Feb. 2-3—George T. Bragg, L. A. McArthur, W. T. Neill, D. B. Leonard, Guy E. Davis, J. A. Lockhart, C. O. Bunnell, John Dierdorff, V. R. Churchill, B. P. Baily, W. H. Till, S. E. Skelley, M. G. Kennedy, J. B. Kilmore, G. B. Bocarde, C. L. Jacklett, Walter Potter and R. W. Ray.

At a rural electrification conference held by the Extension Service of Colorado State College and the REA, Feb. 2-3—Walter R. Moulton, utilization representative, REA, Washington, D. C.; H. G. Jordan, professor of electrical engineering, State College; L. B. Johnson, Rocky Mountain representative, General Electric; V. C. Moulton, Mountain States Inspection Bureau; James Coatsworth, Public Service Co. of Colorado; W. E. Code, hydraulics laboratory, State College; G. F. Henry, professor of mechanical engineering, State College; Dr. H. S. Wilgus, head, poultry department, State College; Fred C. Jans, J. E. Morrison, R. E. Cannon, W. H. Hann, Clara Nale, I. W. Patterson, O. S. More, W. I. Johnson, E. G. Rash, Harry W. Guene, J. B. Fitzsimmons, Allen Moore and Ernest Rosener.

Before the Northwest Regional Council—Lewis Mumford, noted sociologist and planning expert: Intelligent exploitation of the resources of the Pacific Northwest will require creation of a Columbia River Authority and abandonment of "metropolitan ambitions" by Seattle and Portland. Strategic subcenters should be established in suburban areas. Industry should not concentrate at the Bonneville dam site because it would be uneconomic as well as ruinous to natural beauty. Instead, electric power should be utilized to aid the diffusion rather than the concentration of industry.

At the two day home appliance sales school held in Vancouver by Canadian Westinghouse, Canadian G-E, Northern Electric Co. and B. C. Electric Railway Co.—Norman Gardner, Westinghouse; E. Ormsby, G-E; J. C. Munro, Jean E. Mutch, Dick Hall, W. C. Mainwaring, H. N. Walters, E. E. Walker, Syd Bowman and J. H. Taylor, B. C. Electric, and D. Brooks, Northern Electric.

In a second series of lighting forums presented by the Western Institute of Light & Vision in cooperation with the Southern California Section, IES, the University of Southern California science department, the Los Angeles School of Optometry and Southern California Edison Co.—Frank A. Hansen, Western Institute; Arthur W. Nye, University of Southern California; E. A. Hutchinson, School of Optometry; Alston Rodgers and Richard A. Buckby, General Electric; Foster K. Sampson and George M. Rankin, Edison Co.; Frank Van Gilluwe, Holophane Co.; H. E. Riggs, Crouse-Hinds Co.; Arthur M. Johnson, S & M Lamp Co.; F. B. Nightingale, Kim Mfg. Co., and Thomas A. Clarke, Libby-Owens-Ford Glass Co. Series of lectures, to be held in Santa Ana, Santa Monica, Long Beach, Ventura, Santa Barbara and Visalia, began Feb. 20.

Before the construction industries section, San Francisco Chamber of Commerce—Lewis H. Brown, president, Johns-Manville Corp.: "The construction industry needs a merchandising technique to move more homes to market."

At a three-day rural-electrification conference held by power company rural men, agricultural engineers and CREA supervisors from the state colleges and representatives of farm-equipment distributors from the five Northwest states and British Columbia in Portland, Jan. 25-27—L. J. Smith, head of the agricultural engineering department, Washington State College: in charge of the session devoted to miscellaneous electric utilization; D. B. Leonard, Pacific Power & Light Co.: in charge of the irrigation session; W. A. Schoenfeld, dean of the Oregon State College Experiment Station: presenting Portland General Electric's motion picture illustrating the advantages of irrigation in the Willamette Valley, Ore.; F. E. Price: chairman of the crop processing session; S. J. Bowman, B. C. Electric Railway Co.: discussion leader in the poultry-farm electrification session; W. R. Newmyer, Portland G. E.: in charge of the session in which the advance in rural-electrification education through 4-H clubs was discussed by H. C. Seymour, leader of this work in Oregon; Hobart Beresford, University of Idaho, etc.; Robert Overstreet, Idaho Power Co.; discussion leader in the session devoted to refrigeration on the farm and the freezing of fruit and vegetables. F. Earl Price, agricultural engineer, Oregon State College, was largely responsible for programming the subjects discussed; Portland utility representatives took care of arrangements. The meeting, which was without definite sponsorship, was designed to combine the separate conferences held each year by some of the agricultural colleges of the region.

Before the Utah Section, AIEE, in Salt Lake City—A. W. Copley, Pacific Coast engineering manager for Westinghouse: Smashing atoms.

Before the Alameda County (Calif.) Master Painters' Assn.—Clark Baker, lighting counselor of the Pacific Coast Electrical Bureau: Color in paint and pigment and the effect of light upon them. As a result of the talk, lectures on lighting have been included in the association's apprenticeship course.

Before the Portland Rotary Club—George H. Wisting, Northwestern Electric Co.: "Bonneville Dam is not needed in the present power picture of the Northwest, but it can be made of great value through development of electrochemical and electrometallurgical industries."

Before the Retail Credit Grantors' Assn., Vancouver, B. C.—W. C. Mainwaring, general sales manager, B. C. Electric Railway Co.: "Advertising is one of the most important responsibilities in connection with modern business, and newspaper advertising for the retailer is the most important single medium. It must be continuous, even if space used is relatively small. Next come the windows. They must be well lighted, attractively dressed and must command attention. Simplicity and balance must be evident."

Before the Victoria, (B. C.) School Board, the Capital City Club, etc.—Bill Mearns, commercial lighting department of B. C. Electric Railway Co., Victoria: "Better Lighting."

Every house needs
Westinghouse
YOU KEEP YOUR PROFIT!
I HARDLY EVER SEE THESE WESTINGHOUSE WATER HEATERS AGAIN AFTER I PUT THEM IN

WESTINGHOUSE WATER HEATER

Service costs average only 73c per unit... DEALER-PROVED!

Here's an electrical necessity for the home that's mighty easy to sell — *and attention-free service keeps it sold!* It's Dealer-proved — exceptionally low service cost means high net profit!

An exclusive combination of four *Home-proved* features — gives you a top-notch, quality-product story to tell and provides the carefree, automatic 24-hour hot water service people want.

Make money and keep it — sell Westinghouse Water Heaters. Your Westinghouse Distributor will gladly show you how. Or, write Dept. 9066, Westinghouse Electric & Mfg. Co., Mansfield, O.

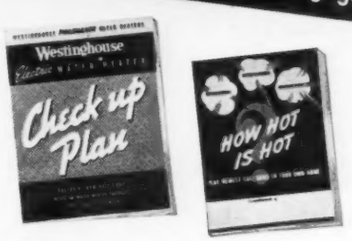
NEW ECONOMATIC CONTROL *Makes Selling Easy*

For prospects who want the utmost in water heating economy. Easily adjusted by the user to secure any water temperature from 120° to 170°. Prospects will like and want this feature.

Westinghouse Water Heaters are manufactured at Mansfield, Ohio, and Emeryville, Calif.

NEW! DIFFERENT! "CHECK-UP" PLAN

Let prospects play the selling game



Interesting new Quiz Game "How Hot is Hot?" entertains prospects while giving them important facts about the many uses for hot water. Sells Westinghouse Hot Water Service. Ties in with the new MKB program. Find out how the plan works. Ask your Distributor for details.

MODERNIZE ELECTRIFY SMART LIVING

Westinghouse *Home-proved* Water Heaters

MADE IN THE WEST . . . FOR WEST COAST USERS

TORK CLOCKS

NEW ELECTRICALLY DRIVEN 1939 MODELS NOW AVAILABLE

WITH PLAIN OR ASTRONOMIC DIALS

Whenever it is desired to turn Current on and off Regularly there is a new model Tork Clock that can do it.

THE TORK CLOCK CO., Inc.
MOUNT VERNON, N. Y.

Representatives:
A. R. Slimmon, 445 E. 3d St., Los Angeles
Noad & Nicholas, 1063 Howard St., S. F.
H. M. Sayers, 1019 Eastlake Ave., Seattle
Stevens Sales Co., 41 P. O. Place, Salt Lake City

G.C.A.
Lamp Replacers
Lamp Base Removers
Cartridge Fuse Tongs
Switch Hooks
Send for Catalogue
We have been making safety tools for 24 years
THE G. C. A. Manufacturing Co.
Pittsfield, Mass.

ELECTRICAL TESTING LABORATORIES
Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.
80th St. and East End Ave., New York

Electrical West
For Birthdays

It's tough when the kid gets so blasé he doesn't enjoy ties or books or pens for his birthday. But it's no problem at all if he's in college or school, training to enter the electrical industry.

Give him a head-start on his classmates. Give him Electrical West, the all-industry magazine of progress.

LETTERS

Timely

DEAR SIRS:

The article in the February issue of ELECTRICAL WEST, under the subject of "Too Many Cooks," is indeed very timely. I certainly hope that it will start the ball rolling and enable us to correct the very bad situation that exists today.

REESE MILLS,
Mgr., Range & Water Heater Dept.
Westinghouse Electric & Mfg. Co.

Corrections

DEAR SIRS:

Permit me to call your attention to a table entitled "Transmission Lines from Boulder Power Plant" on page 45 of the February issue of ELECTRICAL WEST and point out that, in the data concerning the Nevada-California Electric Corp. line, the Westerly terminus is given as San Bernardino and you have shown an approximate length in miles of 191, whereas the actual length is 222 mi.

The length from Boulder Dam power house to Victor Substation is 191 mi., and perhaps this accounts for the error. However, it is of no great consequence, and I simply wished to call it to your attention so that, in future use of these data, the proper terminal and mileage would be made use of.

R. H. HALPENNY,
Electrical Engineer,
Nevada-California Electric Corp.

DEAR SIRS:

In the February issue of the ELECTRICAL WEST on page 42, there is a short article under the heading of "Calif. Oregon Power Company," which states as follows, "This company does not generate."

Under date of Jan. 5, 1939, answers to a questionnaire were submitted to you which stated that no plant capacity was added during the year, and our interpretation was that the question had to do only with added capacity.

To correct your records, therefore. we wish to inform you that we have over 100,000 kw. of installed hydro capacity, so the statement quoted above is not correct.

J. C. BOYLE,
Vice-president in charge of operation
California Oregon Power Co.

"Preventative"

DEAR SIRS:

. . . I took a look at your typography and find that you are guilty of one of the most common of typographical errors. I am surprised that a McGraw-Hill publication would ever spell the word "preventive", "preventative",—not only in the text, but bold and black in the caption. Tsk! Tsk!

Maybe you would like to hire a small boy to read proof . . .

CLARENCE G. DAVENPORT
The McCarty Co.
Los Angeles

Mr. Davenport refers to ELECTRICAL WEST's January issue. Story: "Through the Wrong End of the Telescope. Too much of our effort is to raise the adequacy of an already finished wiring system. Why not try some preventative medicine?" Although they list both words, Webster's and Funk & Wagnalls' agree that "preventative" is an unwarranted corruption of "preventive." ELECTRICAL WEST bows to the majority opinion.

Glaring Example

DEAR SIRS:

As you may have heard, the federal government within the past two years has loaned $2,563,000 and given $2,097,000 to the Imperial Irrigation District of California for construction of a power system that duplicates entirely the system of our privately owned power utility in the same area—the Imperial Valley, largest irrigated area in the world. In addition, the REA has loaned $700,000 to the same district for construction of rural electric lines. You may recall that amid a huge publicity campaign—news reels, national hook-ups and photographers—Secretary of Interior Ickes on Oct. 17, 1938, opened this publicity owned power system in the Imperial Valley.

Here is a glaring example of the inefficiency of the politically appointed personnel of this government power system: Last week one of our crews was called to rescue a lineman of the political power system who was being burned to death while his fellow crew members stood by too frightened and inexperienced to know how to rescue him.

Enclosed clippings from local newspapers give a fair account of the event.

You may be interested in knowing that although in two elections the electorate of the local irrigation district voted 10 to 1 and 24 to 1 to go into the power business, our company is more than pleased with the business it has held so far in the competition between government and private business.

After 72 days of competition, our company has retained 77.9% of its business, and already has reconnected 118 customers who left us to go to the government power system. The most common explanation of this inconsistency of people voting for a power system and then not using it is: Politicians Get Votes—Businessmen Get Business.

HARRY R. BURTON
Assistant Advertising Agent
Nevada-California Electric Corp.

Wrote the Westmoreland (Calif.) *Mail* about the rescue: "While hooking up a customer, Roy L. Edmondston fell against a 6,900-volt wire and immediately became unconscious. Jack Halsey, who was on the pole with Edmondston, cried for help, but the District linemen on the ground apparently were too stunned to move. Joe Steele and Frank Armstrong, patrolling a Nev-Cal line 100 yd. away, heard the cries and ran toward the pole shouting for Halsey to release his fellow worker. When they arrived at the base of the pole Edmondston had slumped from the charged line and was hanging by his belt. Throwing a line to Halsey who fastened it around the unconscious form, Nev-Cal linemen lowered the victim to the ground. Steele immediately applied prone resuscitation. . . . Edmondston is expected to recover."

Add Layout

DEAR SIRS:

I congratulate you upon the new format of ELECTRICAL WEST. I think the changes are an improvement and make the magazine very attractive and "readable."

With best wishes for your continued success.

W. K. VANDERPOEL
Vice-president
The Okonite Co.
New York

You Should be on

SPEAKING TERMS

with every one of these

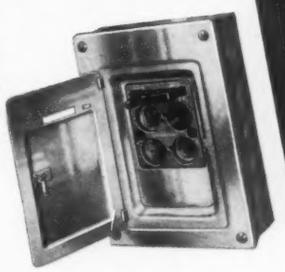
COLT SERVICE Equipment Devices

. . . they mean Cash in the Till to You

No. 35N6-F Flush Type Cabinet with Provision for Transformer and Despard Switches

FUSELESS MAIN SWITCHES . . . with Branch Circuits

Equipped with as many as six branch circuits, as now permitted by the National Electrical Code. Front operated Rotor Disc type switches, 30 Ampere, 125-250 Volts, with Solid Neutral. Cabinets supplied for Surface or Flush Mounting with or without provision for both bell ringing Transformer and Despard type switches. Plaster adjustments for flush type cabinets. Dome covers permit use of non-tamperable fuses. Interiors are quickly removed from cabinets for wiring . . . the mechanism is designed for long wear and maximum safety.



No. 32N3

FUSIBLE MAIN SWITCHES . . . with Branch Circuits

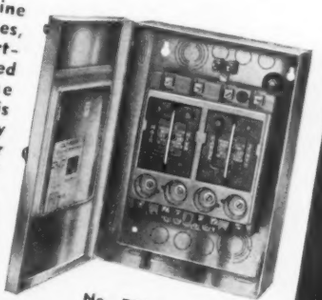
Front Operated
30 Amp. Rotor Disc Type
Flush or Surface Cabinets

No. 29L4-F

These devices are similar in design to the Fuseless Main Switches described above. They provide in one complete unit, a main switch and both main and branch fuses, with or without provision for bell ringing Transformer and Despard type switches. 30, 60 and 100 amperes, 125-250 Volts, with Solid Neutral. Surface or flush cabinets. Plaster adjustments for flush type cabinets. Interior units are easily removed . . . covers designed for use of non-tamperable fuses. Ruggedly constructed, with simple, safe mechanism.

PULL OUT SERVICE SWITCHES . . .

with Branch Circuits
3 Pole, 125-250 Volts, Solid Neutral



No. 7RL4

In this complete line of Service Switches, the 60 Ampere cartridge fuses are located in removable fuse holders. The circuit is opened by simply withdrawing the holder from the block. The entire switch mechanism is removable and the block can be reversed to bring lighting circuits at the top. Fuse Holders and Plug Fuse Receptacles are accessible through an auxiliary door in the cover . . . and full clearance is allowed for non-tamperable fuses.

COLT *Electrical Products . . .*

Manufactured by a World Famous Organization

COLT'S PATENT FIRE ARMS MFG. CO., Hartford, Conn.

COLT OZARK Electrical Division

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PROFILES OF THE MONTH

FAIR FACES

A few of the men who have contributed most in time and effort to make the Golden Gate Exposition electrically successful. At left, W. R. Van Bokkelen, chief of the division of electricity for the fair, former chief engineer of Coast Counties Gas & Electric Co. At right, George E. Garthorne, assistant engineer in charge of construction, was formerly identified with Golden Gate Bridge, Hamilton Field, and Hunter & Hudson. With him is A. F. Dickerson, illuminating engineer, General Electric Co., Schnectady, under whose direction the decorative lighting for the Fair was planned and executed. He has been giving talks on the Fair lighting to engineering and electrical groups in the West during the past month; will give more this, and present a paper on it for the IES convention in August in San Francisco.

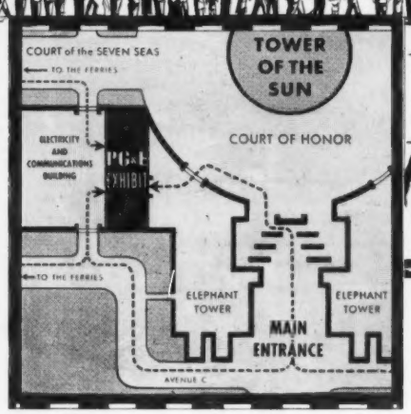
At left, is Jean de Ellas, who as superintendent of shops at the Fair has had charge of fabrication of the decorative lighting standards used in the courts and grounds.

At right, is "Bud" Goodenough, superintendent for G. Walter Spencer (standing with him), electrical contractors who wired the California Pavilion, Argentine Building, U. C. science exhibit and other jobs at the fair. Spencer has been president of the San Francisco Electrical Contractors' Assn.

Left, Ken Ryals, of Stone Ryals Electric, who wired the exhibits of P. G. & E., Pacific Electric Mfg., the cooperative electric appliances, etc. He is also a past president of the contractors.

Right, the electrical inspectors Ralph Wiley detailed to inspect the wiring for the City of San Francisco, Nick Siggins, who has been at the fairgrounds from the first, and Charles Romick, who soon followed to take care of the great volume of inspection.

GOING TO THE FAIR?
WHERE SHALL WE MEET?
PACIFIC GAS AND ELECTRIC COMPANY
A PIONEER IN DEVELOPING THE WEST
PACIFIC GAS AND ELECTRIC COMPANY



Meet your friends at the P.G. and E. Exhibit on Treasure Island

There are many happy months ahead for all Californians with a World's Fair right at home. Of course, you will go many, many times. You will plan to meet friends and relatives to see what's new, educational and entertaining on Treasure Island in San Francisco Bay.

Accept our invitation to use the P. G. and E. Exhibit in the Electricity and Communications Building right by the main gate . . . Portals of the Pacific . . . as a meeting place to keep appointments. See the colorful and entertaining exhibit this company has created for your pleasure. Courteous attendants will be on hand to assist you. Make use of this newest P. G. and E. service.

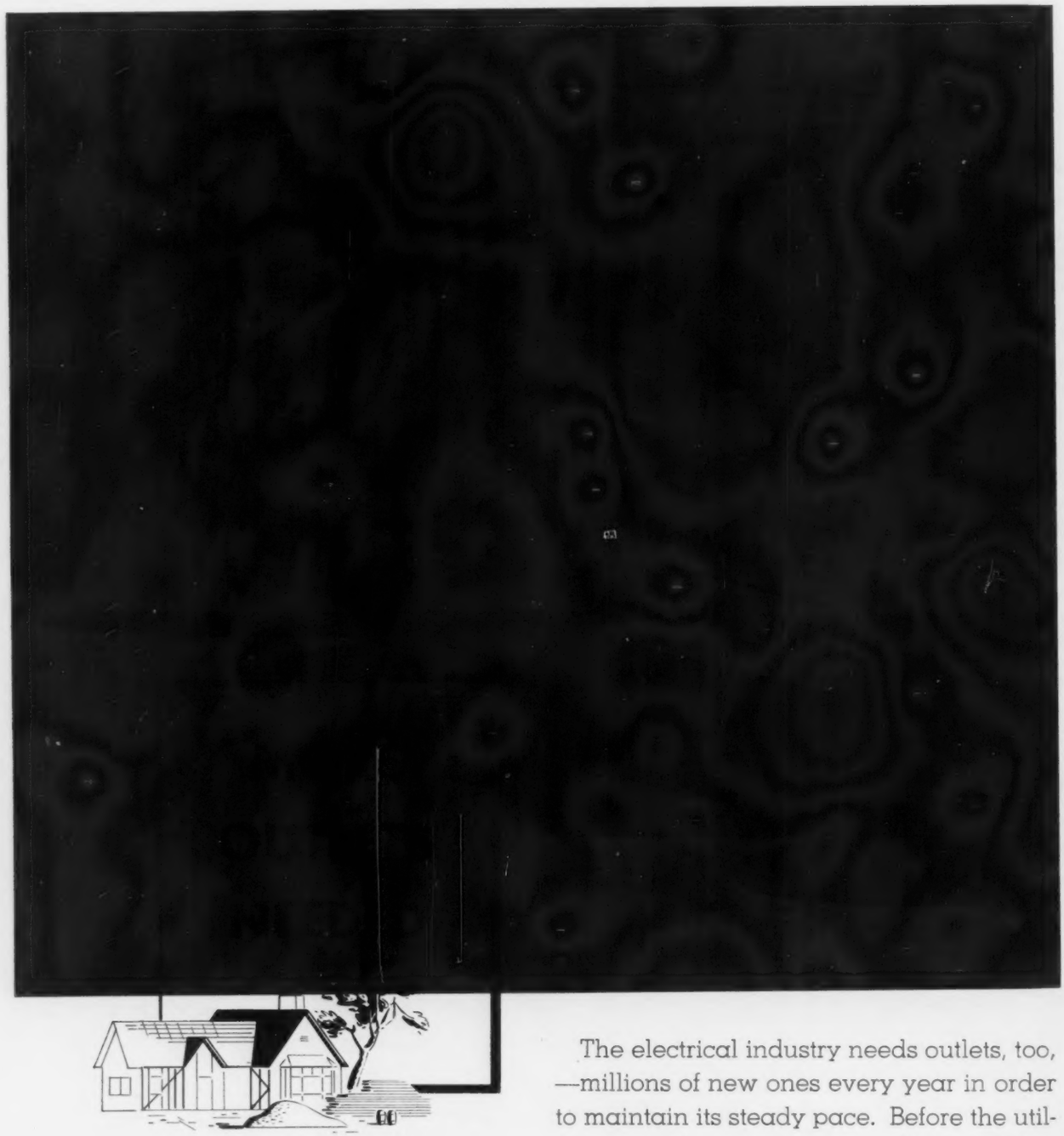
P·G·and E·

PACIFIC GAS & ELECTRIC COMPANY

In the Center of Everything

Whether you come by auto, on the bridge,or by ferry, to the Golden Gate International Exposition on Treasure Island in San Francisco Bay, you will want to start at the center of things. That means you will enter through the Portals of the Pacific to the Court of Honor and the Tower of the Sun. The Electricity and Communications Building and the P.G. and E. Exhibit are immediately to the left. A handy place to meet your friends, leave appointment messages, write letters to friends near and far, and see the colorful and romantic exhibit of your gas and electric company.

EW 103-339



Why are the waters of Lake Tahoe crystal-clear while those of the Salton Sea are brackish and bitter? Simply because Salton Sea lacks an outlet and is thus doomed to stagnation forever.

The electrical industry needs outlets, too, —millions of new ones every year in order to maintain its steady pace. Before the utility can sell more current, or the manufacturer more equipment, the consumer must be supplied with added electrical facilities.

Let's all campaign for More Outlets in Use during 1939. It's an effort in which the entire industry shares the benefit.

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PACIFIC COAST *Electrical* BUREAU

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